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THE MOTOR WORLD

Trade Paper Giving the World's Motor News

Vol. XXXII No. 1

New York, June 27, 1912

Ten cents a copy
Two dollars a year

TRANSPORTATION LIBRARY

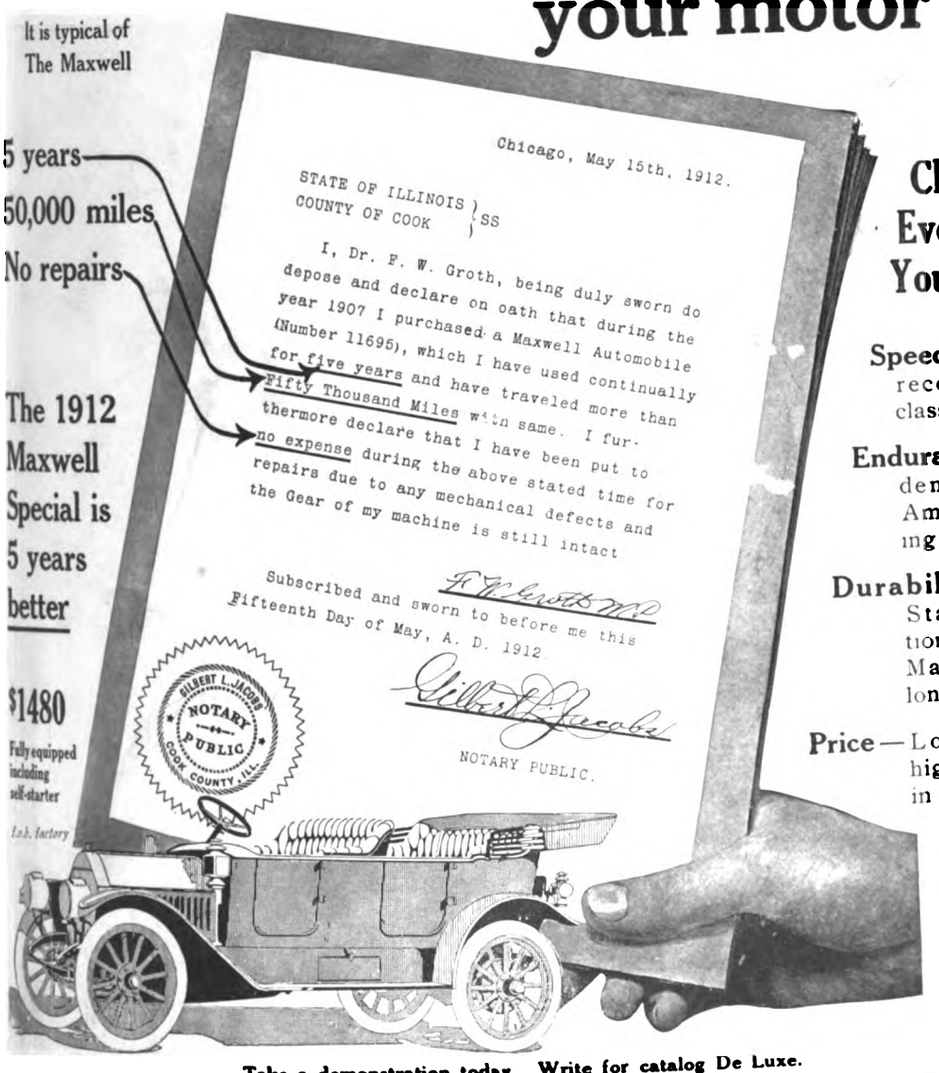
The kind of service you want in your motor car

It is typical of The Maxwell

5 years
50,000 miles
No repairs

The 1912 Maxwell Special is 5 years better

$1480
Fully equipped including self-starter
f.o.b. factory



The Champion Every Way You Figure

Speed—World's record in its class.

Endurance—Glidden winner—American Touring Champion.

Durability—N. Y. State registrations show that Maxwells last longest.

Price—Lowest priced high-grade car in the world.

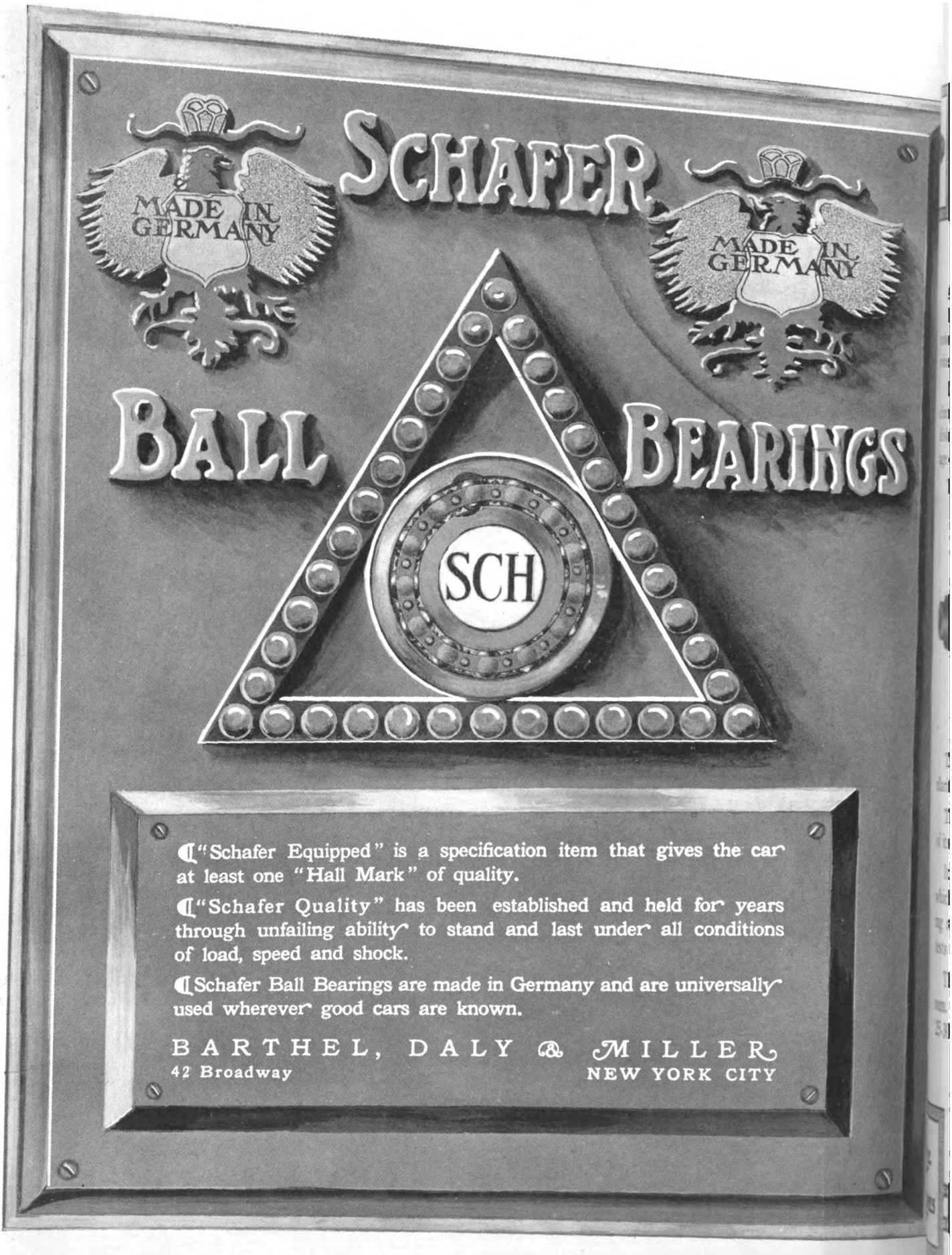
See it; Ride in it; Test it; Compare it with others

Take a demonstration today. Write for catalog De Luxe.

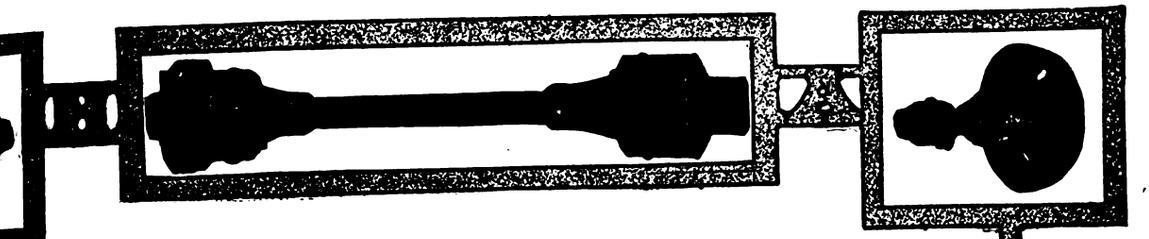
United States Motor Company, 1 West 61st St., New York

Weekly by The Motor World Publishing Company, 1600 Broadway, New York

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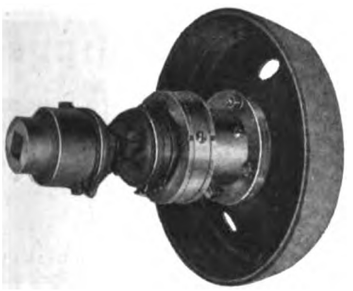
Why a Cone Clutch?

A really good disk clutch is, in a way, better than the cone clutch.

But the construction cost of a disk clutch is four times that of the cone—an amount clear out of proportion to the difference in service.

Disk clutches are not dependable. Even a properly designed clutch of this type may develop inaccuracies of manufacture, warped disks and other failures that go to make the action of a large percentage of this type unsatisfactory and unreliable.

The cone clutch is more accessible and simpler than the disk. Absence from complicated parts always tends toward perfection in the matter of performance.



The strongest argument, however, against the disk clutch lies in the fact that demand for it almost amounting to a craze reduced manufacturing methods to a point where effort was made to produce the disk at the same price as the cone.

The resultant deluge of trouble is causing a logical return to popularity of the earlier form of cone clutch.

The Hartford cone clutch, shown here, made in the largest factory of its kind in the country, is a model of precision as well as of design.

It is a clutch that can be depended upon to work and last—one in which the finest quality of material has been combined with machining refinements—great enough to successfully pass grilling physical tests for strength and accuracy.

The Hartford cone clutch comes in either pressed steel or aluminum. Weight the same, complete equipment 30 pounds. Two sizes 25-30 and 35-45 horsepower.

Let us help you solve your cone clutch problems.
Our engineering department is at your service.

J. S. BRETZ CO., New York, Detroit, Sole Selling Agents.

CONE CLUTCHES

HARTFORD AUTO PARTS CO.
HARTFORD, CONN.

UNIVERSAL JOINTS

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EXPERIENCE — SHELDON — RIGHT DESIGN
FACILITIES — AXLES — RIGHT STEEL
"Made in the Largest Axle Factory in the World"

One Truck Out of Every Twelve Is a Chase. Chase Trucks Are All SHELDON Equipped.



Chase Motor Truck Company
Commercial Cars
332 South West Street
Syracuse, N.Y. U.S.A.





Chase Motor Truck Company
Commercial Cars
332 South West Street
Syracuse, N.Y. U.S.A.



Nov. 1, 1910.

The Sheldon Axle Co.,
Wilkes Barre, Pa.

Gentlemen:-

In renewing our contract for motor wagon axles with you for another year, we are very glad to say a good word.

We have had very excellent success with these axles in all kinds of commercial work and in nearly every part of the world. We find that the Sheldon Ball Bearings which you furnish on these axles, stand the usage which our business demands, with splendid success.

With best wishes, we are,

Yours truly,

CHASE MOTOR TRUCK COMPANY

A.M. Chase
President

AMC/HD

November 14, 1912.

Sheldon Axle Company,
Wilkes Barre, Pa.

Gentlemen:

In renewing our contract for Motor Wagon Axles with you for another year, we are very glad to say a good word.

We have had very excellent success with these axles in all kinds of commercial work and in nearly every part of the world We find the Sheldon Ball-Bearing axles that you furnish with these axles to stand the usage which our business demands.

Withing you continuous success, we are,

Yours truly,

CHASE MOTOR TRUCK COMPANY.

H.A. Fingeberg Jr.
BUSINESS MANAGER.

HAK/KFW

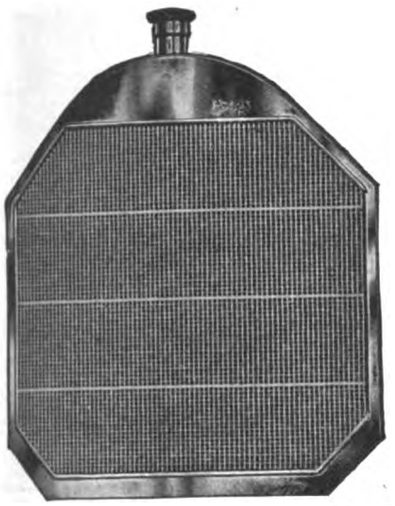
The two letters shown here were written in 1910 and 1911, respectively. They tell a strong story of consistent belief in SHELDON Axles.

SHELDON AXLE COMPANY, Wilkes-Barre, Pa.

CHICAGO OFFICE
68 East 12th St.

DETROIT OFFICE
1215 Woodward Ave.

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The Mayo—the radiator thoroughbred

¶ Mayo Radiators are standard on a number of well known makes of cars—in all instances, cars in which quality predominates.

¶ Mayo Radiators offer a maximum of radiating service and are immune to leakage except in case of accident. We offer them as models of correct design and construction.

¶ Every radiator is guaranteed to live up to the requirements set for it and we stand back of this guarantee.

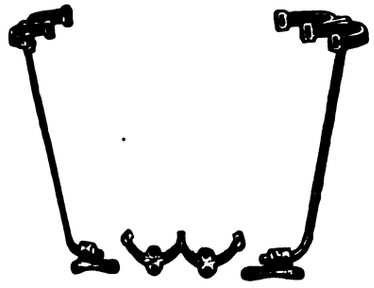
¶ Let us give you some facts concerning the Mayo system and its application.

Mayo Radiator Company
NEW HAVEN, CONNECTICUT

The Largest Automobile Supply House in America

FIFTEEN STORES IN THE UNITED STATES

"Torpedo" Tire and Demountable Rim Holders



Designed especially for use on Torpedo body or Fore-door cars Set consists of two strong arms firmly bolted to running board and permitting of sufficient adjustment to accommodate two tires or demountable rims, of standard sizes, 4 inch or smaller. Made of solid Brass and guaranteed to give perfect satisfaction.

Finish: Furnished in Hard Rubber Black Enamel finish, and full Polished Brass.

	Brass	Black
Price, complete with Straps...	$4.00	$3.00

A dozen other styles and sizes in stock. See catalog.

Our 1912 Catalog, which is held as a book of reference by manufacturers, dealers and automobile owners, will be mailed on request. Circulation limited to 100,000 copies.

Chas. E. Miller

MANUFACTURER, JOBBER, EXPORTER AND IMPORTER

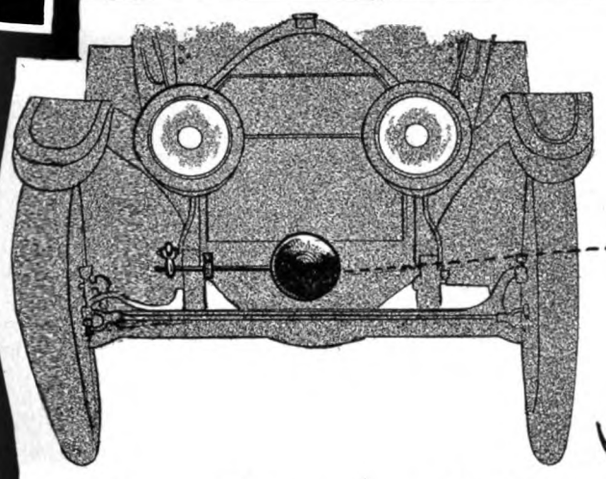
HOME OFFICE

97-99-101-103 Reade St., New York City

ORDER FROM NEAREST BRANCH, ADDRESS CHAS. E. MILLER

NEW YORK CITY—97-103 Reade St.
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NEW ORLEANS, LA.—601-603 Barrone St.
NEWARK, N. J.—274 Halsey St.
SPRINGFIELD, MASS.—Bridge & Dwight Sts.

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"This is No Place for Us"



You Cannot Use an Old Fashioned Crank On

THE NATIONAL STARTER

Every car equipped with the "hundred and one" self starters, also carries a crank.

You know why.

A self starter that is even 99 per cent efficient is still fallible—and on the first failure, out comes the crank.

The National Starter has no provision made for hand cranking.

The end of the crank shaft is covered by the metal casing shown here.

It's pretty clear, then, that the National Starter must be 100 per cent efficient—therefore infallible.

Archimedes once said:

"Give me a lever long enough and I will move the world."

On this principle we have reduced engine inertia and compression resistance to a minimum.

The National Starter is just an ingenious arrangement of high and low ratio levers hooked up with a segment engaging a bevel gear on the crank shaft—That's all.

You simply push the pedal with your foot, without leaving the car or changing position.

This device operates directly, naturally and mechanically, saving the engine from the terrific shock of exploding gas against the inert piston head—

And it has no operating cost—no bills for gas and upkeep of complicated compressed air or electrical apparatus.

Now, Mr. Dealer, if you want to join the growing ranks of those who see the "handwriting on the wall" concerning the unreliable elemental self starters—

Then write for our proposition.

NATIONAL GAS ENGINE STARTER COMPANY
30-32 North Dearborn Street **Chicago, Illinois**

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"The Horn that's Made for the Discriminating"

TUTO HORN

THE TWO TONE HORN

Low Note Horn Necessary

EVERY experienced motorist acknowledges that a low note service warning signal is necessary for ease and comfort in driving.

¶ The laws of most countries demand a low signal note and in many cases the louder signal is barred from use.

¶ The continual use of a one-note-extremely-loud warning signal, rightly invites adverse legislation.

¶ Car occupants, especially women, demand a mild signal for regular service and refuse to put up with the inflexible, unnerving and racking blast of the loud one-note emergency signal.

¶ The loud emergency signal is necessary and many large cities demand it as a part of the motor car equipment.

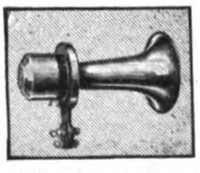
¶ These same cities surround the use of this loud signal with such restricted regulations, that the driver is in a quandary as to whether the use of the horn will invite arrest, or that the failure to use the signal will promote an accident.

¶ This surely is inefficiency personified.

¶ Why put up with such an inflexible condition when the TUTO Horn, with its double service, will do all of the signalling of the car—a low note for ordinary service, effective 90% of the time—a loud note for emergencies, instantly responsive by a full pressure on the same button that gives the milder signal.

¶ The TUTO Horn comes complete with all materials for installing, so as to make a very neat and most permanent job. The cost is $25.00 in any finish and with a long or short projector.

¶ You will make no mistake to specify the TUTO Horn on your new car.



TUTO Horn, $25.00

The Dean Electric Co.

260 Taylor Avenue, Elyria, Ohio

"Look for Dean where Quality's seen"



TUTO-ETTE $17.50

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THE MOTOR WORLD
Hyatt Roller Bearing Editorial

Detroit, Mich., June 27, 1912

Bearing Theory

Advertisements are not read because entertaining fiction can be had in far more attractive dress. How much better it would often be to tell some one interesting fact and let that fact teach its own lesson.

Take for Example the theory on which a roller or ball bearing is constructed. Think for a moment what is asked or expected by so many people of a roller or ball in a bearing—overlooking entirely that each has but a limited capacity, and that either can consistently have but one axis of rotation.

The Most Perfect Bearing of the ball type for radial loads now made is the "two point contact" or annular. In such a bearing a ball 3-8 inch diameter has a maximum safe working load less than 300 pounds. Greater loads produce distortion sufficient to make the ball useless as a transmission element, while any other form of race reduces even this safe load.

The Small Capacity is due to the concentration of load on a minute surface of contact, ordinarily called a "Point." A radial bearing employing rollers increases this contact surface enormously, at the same time increasing the value of the bearing as a load carrier. This is the result of what is known as "Line Contact."

To Carry Radial Loads without introducing wedge action and destructive internal stresses (as in present forms of tapered rollers or "Cup and Cone" balls) it is essential that the axis of rotation of the rollers or balls be always parallel to the axis of the shaft.

Destroy this Feature—essential to correct operation—and the balls will spin and wear. Solid and rigid rollers will get out of line and bind, causing either increased friction or complete failure of the bearing. Accurate workmanship and durable material in bearing construction are both sufficiently rare and costly without adding the burden of improper design.

Hyatt Flexible Rollers combine the advantages of Line Contact and ability to maintain practical alignment without increase of friction or wear in the bearing.

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Hartford Pointers—No. 4

Greater Safety—and Easy Riding

A BROKEN SPRING encourages trouble—invites disaster. Without proper prevention spring breakage is ever a possibility.

Imperfect traction results in loss of steering control. A car that is subject to jumping—whose wheels do not cling to terra firma—is hard to drive, difficult to steer.

A bursting tire is the dread of every motorist, not only because of the expense it involves, but the danger it so surely incurs.

Spring breakage is virtually an impossibility when the car is equipped with the

Truffault-Hartford SHOCK ABSORBER

and the other dangers are in a large measure prevented.

The Truffault-Hartford maintains an even, constant, frictional resistance to the excessive contraction and expansion of the spring—such a resistance as invariably holds the spring in perfect control but does not lessen, in the least, its flexibility.

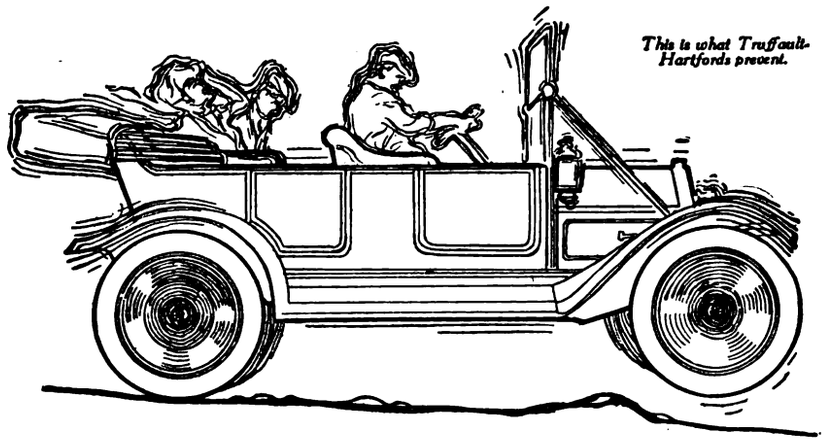
Thus the jolt and jar are eliminated and spring action made normal under all conditions of road. Thus the springs are saved from all undue strain. Thus the wheels are kept constantly on the ground; loss of traction overcome, and the destructive bouncing of tires avoided. Thus, too, the vibration which accompanies excessive spring action is reduced to a minimum; wear and tear on engine and parts becoming perceptibly less.

These, then, are the advantages in both Safety and Economy that you gain by equipping your car with Truffault-Hartford Shock Absorbers.

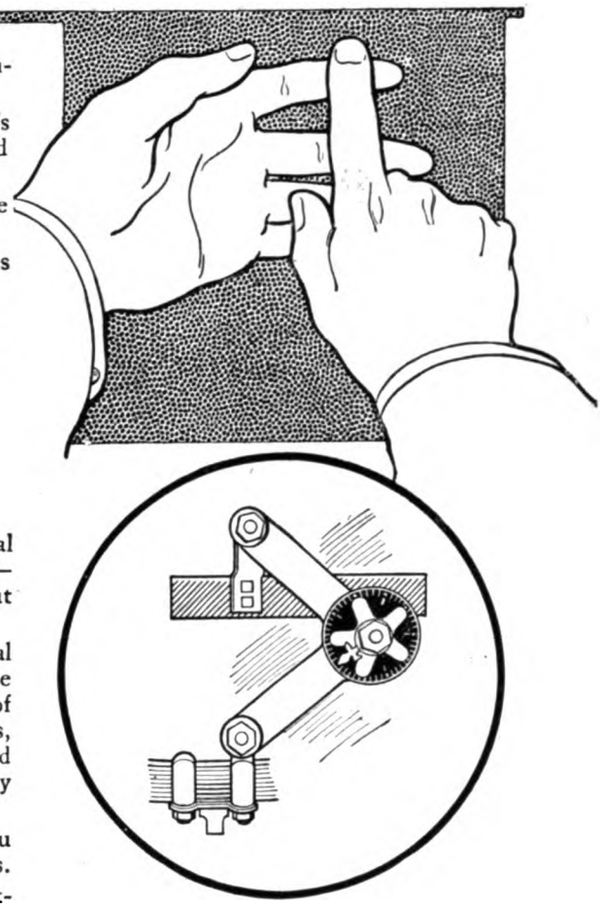
But, consider also the greater car-comfort that the Truffault-Hartford makes possible—consider how much it means to you and those who ride with you, to be able to travel over rough stretches of road without reduced speed and with neither jolt nor jar. Truffault-Hartford equipment will make you proud of the riding-qualities of your car—will improve them beyond your expectations.

The first cost of Truffault-Hartford equipment is practically its only cost. Readjustment is seldom necessary and may be made with a wrench. As for durability, Truffault-Hartfords will outlive the car itself. With each set is furnished a blue print showing the correct method of attachment for the make, year and model of your particular car. Built in four sizes: $60.00, $45.00, $25.00, $15.00, per set of four.

24 automobile manufacturers include the Truffault-Hartford in the regular equipment of every car they produce.



This is what Truffault-Hartfords prevent.



Talk to your dealer about this device. He is ready to answer any questions you may have. Investigation does not involve any obligation whatsoever. Our interesting catalog is worthy of your attention. Let us send *you* a copy.

The Hartford Suspension Co.

E. V. HARTFORD, Pres.

164 Bay Street Jersey City, N. J.

BRANCHES

NEW YORK.....1700 Broadway
NEW YORK.....212-214 West 88th Street
JERSEY CITY.....141-143 Morgan Street
BOSTON.....319-325 Columbus Avenue
CHICAGO.....1458 Michigan Avenue
DETROIT.....303 Woodward Avenue.
KANSAS CITY.....1524 Grand Avenue
NEWARK.....289 Halsey Street
PHILADELPHIA.....1437 Vine Street

Spring action being necessary to secure easy riding, auto owners should avoid so called shock absorbers working on the **eccentric** cam and **wedging** principles. Such devices limit the play of the springs, creating a condition undesirable, if not actually dangerous.

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Panel Body, $1800
Capacity, 1500 Pounds

Lippard-Stewart Delivery Cars

Panel Body . .	$1800
Express Body with Top	$1775
Open Box Body,	$1775
Stake Body . .	$1775
Police Patrol . .	$2325
Ambulance . .	$2325
Hotel Bus . . .	$2325

Make Money Selling Lippard-Stewart Motor Delivery Cars

Scores of live dealers throughout the country are realizing the big money-making possibilities of handling Lippard-Stewart delivery cars.

They have discovered that this car—the first high-grade commercial car at a low price—is just what merchants have been looking for.

They have found that the many up-to-date, exclusive features of the Lippard-Stewart make it a quick and easy seller. Everywhere this car appears, it immediately attracts favorable attention and brings orders.

Our business is showing a wonderful increase each month. Our dealers all predict a record year.

Here Is Your Opportunity

The commercial car field affords the biggest opportunities nowadays. In this field the light delivery car offers the widest market; and among light commercial cars none is such an attractive selling proposition as the Lippard-Stewart.

Consider the following reasons why this car will prove a profitable line to handle:

1. Lippard-Stewart cars know no "seasons." They are always needed and sell just as readily in winter as in summer.
2. Fancy showrooms unnecessary to sell Lippard-Stewart delivery cars. The service and utility of these cars are enough to win the orders.
3. It is easy to show merchants how Lippard-Stewart delivery cars will pay for themselves out of the savings they effect over horse delivery.
4. No trouble to locate prospects for Lippard-Stewart cars. Every merchant who delivers goods is a prospective buyer.
5. You can sell several cars at once by the same effort that would sell one pleasure car. Satisfactory service makes repeat orders easy.
6. Lippard-Stewart cars are the first light delivery cars to embody all the latest and best features, such as:

Four-Cylinder Monobloc Motor.	Bosch Magneto Single Ignition.
Selective Transmission.	Thermo-Syphon Cooling.
Multiple Disc Clutch.	Special Spring Suspension.
Special Timken Rear Axle.	Every Part Accessible.
Left-Hand Steering.	Handsome Lines—Beautiful Finish.

We Want More Dealers

We still have some choice territory open for dealers. Perhaps your city is one where we are not yet represented. If so, do not overlook this opportunity. Fill out and mail the attached coupon for our dealers' proposition. Let us help you make this the most profitable year you have had.

Sending in the coupon may be the means of doubling your profits for this year.

Lippard-Stewart Motor Car Co.
BUFFALO, N. Y.

AUGUST BECKER, President.
J. C. MILLAR, Secretary.
E. J. BARCALO, Treasurer.
C. S. DALQUIST, Chief Engineer.
W. F. REYNOLDS, Sales Manager.

LIPPARD-STEWART MOTOR CAR CO.,
Buffalo, N. Y.
Please send catalogue and dealer's proposition.
Name .....
Street .....
City..... State.....

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The *Little* Fellows Can't *Do* It

New York City has a $5,000,000 library. It's the *finest* in the *world*, but it cost New Yorkers only one dollar apiece. If a city of a million people tried to raise a building as large, it would cost each citizen five times as much.

The same principle holds in the speedometer business.

The Stewart factory makes *four* out of *five* speedometers in use. The population of Stewart users is so large that we can make the best speedometer in the world and ask the *least* for it.

For *work* or for *looks* the Stewart is *best*. Scant sales at high price is the tale of the rest.

Magnetic principle—jewel bearings—wearing parts hardened and polished; open dial—large figures, easily read—absolutely accurate; 100,000-mile season odometer, 100-mile trip register, can be reset to any tenth of a mile. Guaranteed for five years. Strongest flexible shaft—drop forged swivel joint—noiseless gears.

"ALWAYS ON THE JOB."



Speedometers $15 to $30
Clock Combinations, $45 to $70

STEWART & CLARK MANUFACTURING CO.
1928 Diversey Boulevard, Chicago, U. S. A.

Detroit Minneapolis Indianapolis Los Angeles Chicago Cleveland Boston New York San Francisco Kansas City London Philadelphia Paris

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What Makes the Commercial Car a Practical Possibility?

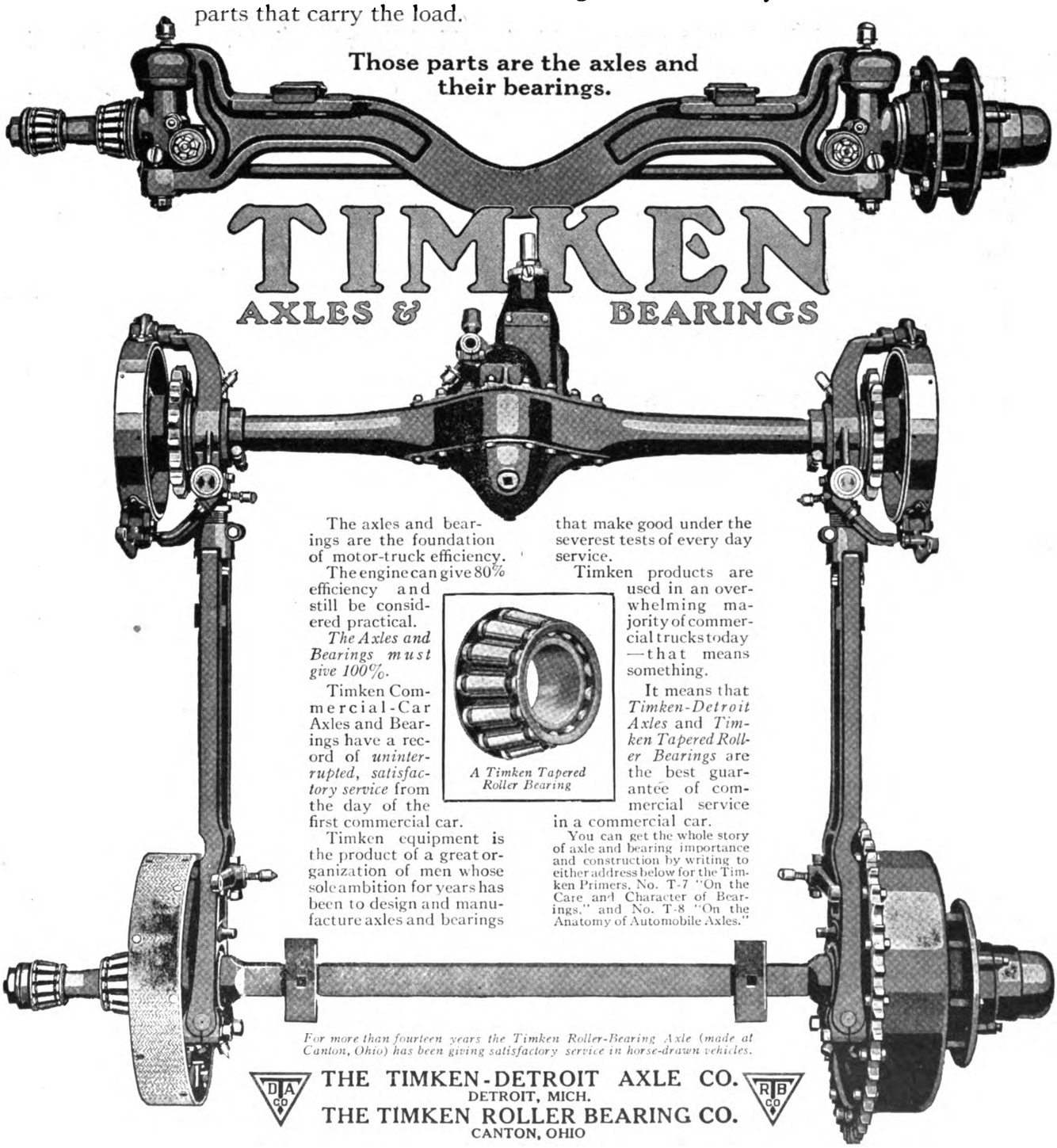
Strength and flexibility in the parts that carry the load.

To be commercial a motor-truck must carry its load in a commercial way.

It must give uninterrupted service—good service—over any road—ten hours a day—*every working day* in the year.

To do this it must have strength and flexibility in the parts that carry the load.

Those parts are the axles and their bearings.



TIMKEN AXLES & BEARINGS

The axles and bearings are the foundation of motor-truck efficiency.

The engine can give 80% efficiency and still be considered practical.

The Axles and Bearings must give 100%.

Timken Commercial-Car Axles and Bearings have a record of *uninterrupted, satisfactory service* from the day of the first commercial car.

Timken equipment is the product of a great organization of men whose sole ambition for years has been to design and manufacture axles and bearings that make good under the severest tests of every day service.

A Timken Tapered Roller Bearing

Timken products are used in an overwhelming majority of commercial trucks today—that means something.

It means that *Timken-Detroit Axles* and *Timken Tapered Roller Bearings* are the best guarantee of commercial service in a commercial car.

You can get the whole story of axle and bearing importance and construction by writing to either address below for the Timken Primers, No. T-7 "On the Care and Character of Bearings," and No. T-8 "On the Anatomy of Automobile Axles."

For more than fourteen years the Timken Roller-Bearing Axle (made at Canton, Ohio) has been giving satisfactory service in horse-drawn vehicles.

THE TIMKEN-DETROIT AXLE CO.
DETROIT, MICH.

THE TIMKEN ROLLER BEARING CO.
CANTON, OHIO

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One Look Tells Everything

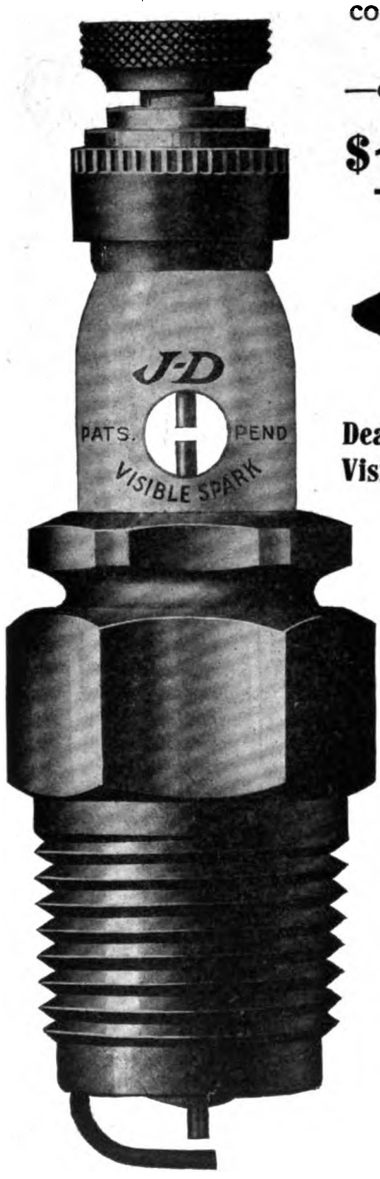
The JEFFERY-DEWITT CO. DETROIT, MICH. Visible Spark Plug lays bare all ignition troubles

The "visible gap" is an open "window" giving you a full view of the internal workings of your spark plug.

If the spark is seen jumping the gap, look for your trouble between the gap and sparking point.

If there is no spark in the gap, your trouble is behind the plug—in Magneto, or batteries, or coil, or wiring.

But for the "visible gap" it would take you many precious minutes —often hours—to locate the seat of trouble.



$1.00 Buys this great new Spark Plug

Indicates in which direction trouble lies.
Facilitates timing of engine.
Intensifies spark in cylinders.
Consumes only minimum current.
Gap adjustable—can be closed entirely.
By widening gap plug cleans itself.
Permits regulating spark for any cylinder.
Costs same as any good plug—$1.00.

Dealers will find J. D. Visible in greatest demand

Visible Idea Worked Out Perfectly for the First Time

The "visible gap" feature, so far as being incorporated in a plug, has always seemed as far away as perpetual motion. The visible feature has been marketed in a separate device for years, but this is the only plug in which this important visible feature is actually embodied.

It is simple. Merely a hole in the porcelain and a spiral action to regulate width of the gap in the central electrode which carries the current.

The hole in no way lessens the strength of the plug, and the current in jumping the "visible gap" loses none of its efficiency. On the other hand it intensifies the spark at the gap in the cylinder.

Additional prestige is lent the J. D. Visible Spark Plug by the fact that it is being introduced by the largest manufacturers of spark plugs in the world. We are exclusively manufacturers of spark plugs; we make millions of them each year.

The J. D. Spark Plug was a famous plug before it was improved by the visible feature. It combines finest workmanship, best materials and simplest designs.

Every part of this plug is made in our factory—even the porcelain being produced in our own potteries from clays and other ingredients imported from Europe.

This unequivocal guarantee goes with all our spark plugs:

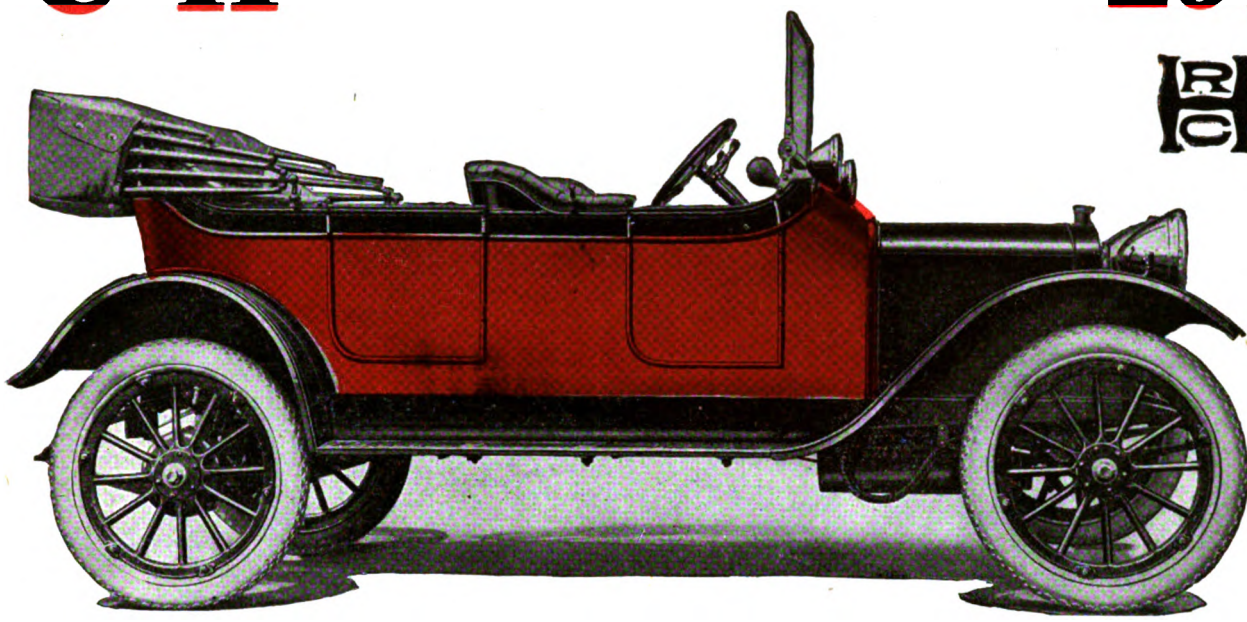
"Your money back or a new plug if you are not satisfied."

If your dealer hasn't the J. D. Visible yet, send your money direct to us for a set, specifying size wanted and make of car, and we will ship them postpaid. Remember, the J. D. Visible Plug is $1.00. Our literature on ignition free for the asking.

JEFFERY-DEWITT COMPANY, 565 Butler Ave., Detroit, Mich.

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R-C-H Announcement 1913



R-C-H "Twenty-Five"

We are determined to build the best all-'round five-passenger touring car in the world and sell it, completely equipped, for

$900

f. o. b. DETROIT

The Car

Wheelbase— 110 inches.

Motor— Long-stroke; 4 cylinders cast en bloc; 3¼ inch bore, 5-inch stroke. Two-bearing crank shaft. Timing gears and valves enclosed. Three-point suspension.

Drive— **Left Side.** Irreversible worm gear, 16-inch steering wheel. Spark and throttle control on steering column.

Control— **Center Lever** operated through H-plate integral with universal joint housing just below. Hand-lever emergency brake at driver's right. Clutch pedal operated by left foot. Service brake operated by right foot. Foot accelerator in connection with hand throttle.

Springs— Front, semi-elliptic; rear, full elliptic and mounted on swivel seats.

Frame— Pressed steel channel.

Axles— Front, I-beam, drop-forged; rear, semi-floating type.

Transmission— Three speeds forward and reverse; sliding gear, selective type.

Construction— Drop-forgings wherever practicable; chrome nickel steel used throughout all shafts and gears in the transmission and rear axle; high carbon manganese steel in all parts requiring special stiffness.

Body— Full 5-passenger English type; extra wide seats; 10-inch seat cushions specially upholstered.

Wheels— Artillery type.

The Equipment

Non-skid tires—32 x 3½.

12-inch Bullet electric head light with double parabolic lens.

6-inch Bullet electric side lights with parabolic lens.

Bosch Magneto.

Warner Auto-Meter.

Demountable rims.

Extra rim and holders.

Tally-ho horn.

Jiffy curtains—up or down instantaneously.

Top and top cover.

Windshield.

Rear view mirror.

Tool-kit, Jack, Tire Repair Kit, Pump.

Robe Rail.

WE invite prospective motor car buyers to call at the nearest R-C-H branch or dealer; to study R-C-H construction and equipment; and, more than all to ride in the car and determine for themselves its running qualities and ease of operation. Descriptive folder and name of nearest dealer mailed on request.

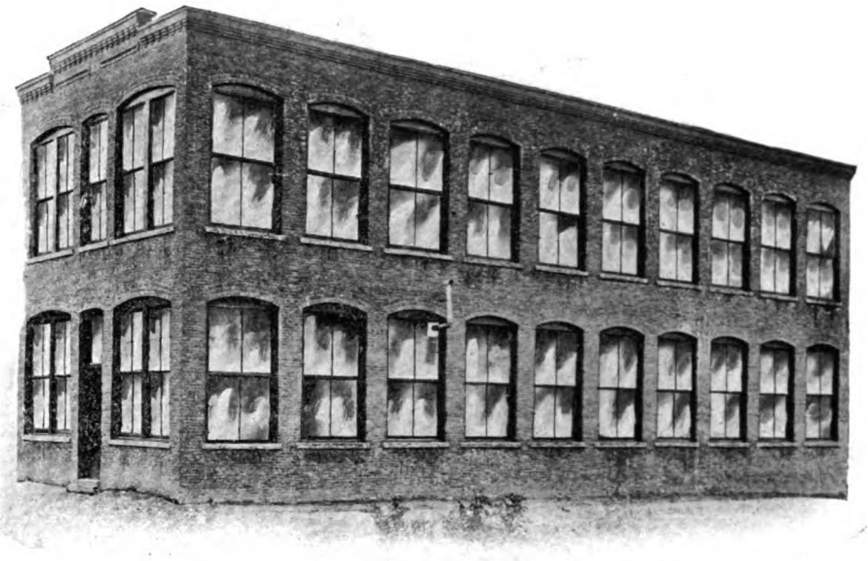
Correspondence invited from responsible dealers in any vacant territory.

R-C-H CORPORATION, 104 Lycaste Street, Detroit, Michigan

Branches— ATLANTA, 548 Peachtree St.; BOSTON, 563 Boylston St.; BUFFALO, 1225 Main St.; CHICAGO, 2021 Michigan Ave.; CLEVELAND, 2122 Euclid Ave.; DENVER, 1520 Broadway; DETROIT, Woodward and Warren Aves.; KANSAS CITY, 3501 Main St.; LOS ANGELES, 1242 So. Flower St.; MINNEAPOLIS, 1206 Hennepin Ave.; NEW YORK, 1989 Broadway; PHILADELPHIA, 330 No. Broad St.; WALKERVILLE, ONT., CANADA.

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New Departure Engineering Building



METALLURGICAL LABORATORY : CHEMICAL LABORATORY
PHYSICAL LABORATORY : HEAT TREATING LABORATORY
ENGINEERING SERVICE DEPARTMENT

Every inch of the large floor space in this building is devoted to two supremely important purposes:

The perfection of New Departure ball bearings by progressive improvements in materials, manufacturing processes and general efficiency of the product.

A study of the practical problems and interests of users of anti-friction bearings, with a constant aim to assist in selecting just the ball bearing equipment that will give greatest efficiency at minimum cost of installation and maintenance.

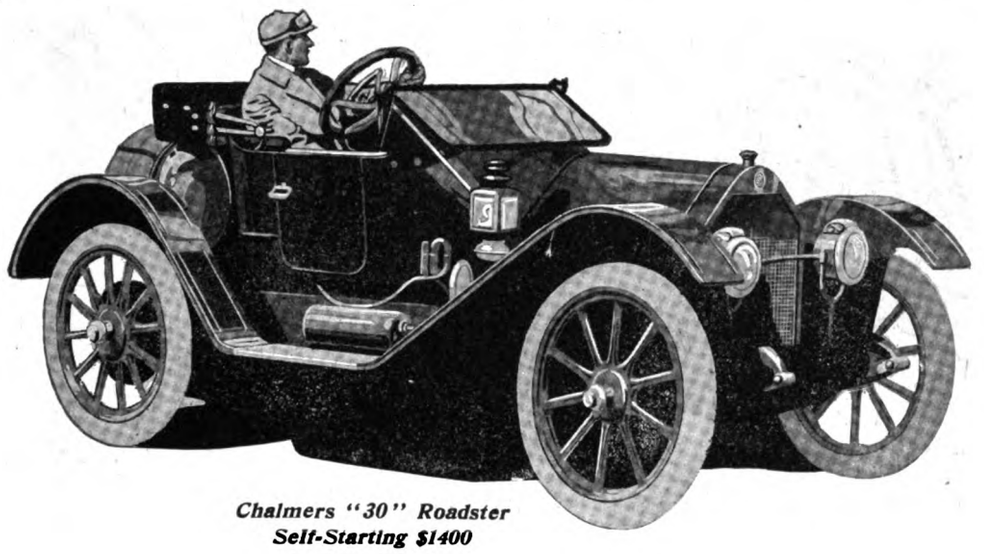
We have secured an equipment for each department that is not excelled anywhere, particularly with reference to ball bearing manufacture and consultation service.

Our exceptional facilities are yours for the asking. In other words, the co-operation of our entire engineering department is at your command for the selection of the type and size of ball bearings adapted to your design and work. Write us today.

The New Departure Manufacturing Co.
BRISTOL, CONN.

Western Branch, 1616-17 Ford Bldg., Detroit, Mich.

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Chalmers "30" Roadster
Self-Starting $1400

This monogram on the radiator stands for all you can ask in a motor car

To Owners of High-Priced Motor Cars

A Chalmers Suggestion

IT is often uneconomical to use your big, luxurious touring car in the routine of business.

Don't you really think you need a light roadster to supplement the service of your big touring car? You have a lot of "running around" to do which can be more quickly and cheaply done in a smaller, handier car.

Here is just such a car—the new self-starting Chalmers "30" Roadster, $1400, fully equipped.

This roadster is designed and built to suit the needs of the busy man. It is speedy, roomy, comfortable, easy to handle, economical and good to look at.

Note These Alluring Features

The body is painted an attractive blue with black mouldings. Hood and chassis, including wheels, are black with blue striping.

The seat is generously wide for two passengers. Gear shift and brake levers are inside the low-hung body.

The stylish, close-fitting top is of brown duck with side curtains and storm front.

This is just the car for business use—a car you can keep down town all day, where the size and weight of your touring car are a handicap and a useless luxury.

Leave Your Big Car for the Family

How often when you have been using the big car, has your wife or daughter wanted it for shopping or calls? A Chalmers roadster would have been a convenience and an economy then—and in a hundred other cases.

The new Chalmers roadster is light in weight; easy to control; the 104-inch wheel base is just right for handling in city traffic —and the Chalmers self-starter obviates the necessity for cranking.

Can you afford to be without a car of such varied usefulness? The $1400 you invest will be returned to you in time saved, in convenience, in comfort—in one season. The price includes Chalmers self-starter, special top, automatic windshield, Prest-O-Lite tank, gas and oil lamps, horn, tire-inflater, jack, pump, full set of tools, and tire repair outfit.

We would like to have you see this up-to-the-minute car. Won't you arrange with the Chalmers dealer for a demonstration at your convenience?

Chalmers Motor Company, Detroit, Mich.

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Simplicity

It is largely the simplicity of construction that makes the Long Horn so reliable and dependable. There is nothing to get out of order—nothing to fail in the time of need.

Remember that a warning signal is seldom needed except in an emergency. The successful warning signal can never record a failure. Not once in a thousand times—for that once is sure to be the time you need the warning most.

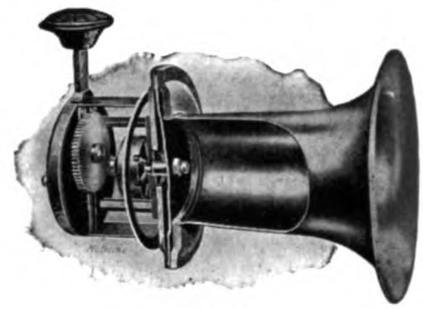
It's because the Long Horn never fails to warn that it is registering its great success.

If you can press the button the horn will perform its functions.

It is not an electric horn—but the superior to any electric horn (when that electric horn is working.)

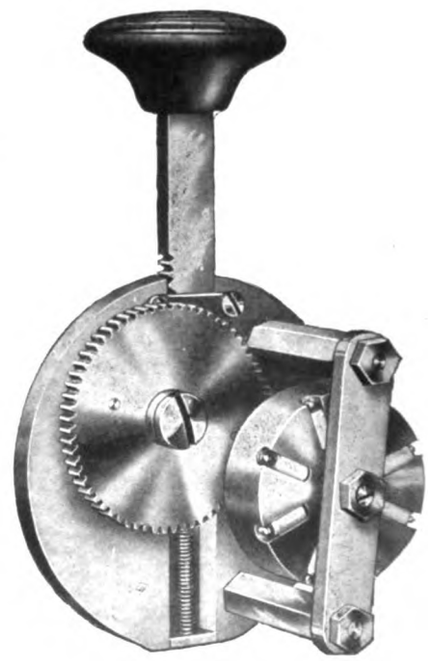
No wires to break—no friction pulley to slip—no batteries to give out—no motor to go back on you—no cost of upkeep—its first cost is its last cost.

Have you joined the army of Long Horn representatives yet? Why wait, when the delay means a loss of money to you?



$18.00

THE LONG HORN



THE G. PIEL COMPANY

13th Street and Boulevard Long Island City

PHILADELPHIA, PA.....1416 Vine Street
BOSTON, MASS.....109 Massachusetts Avenue
MINNEAPOLIS, MINN.....70 So. 10th Street
BUFFALO, N. Y.....852 Main Street
SAN FRANCISCO, CAL.....544 Van Ness Avenue
LOS ANGELES, CAL.....1229 So. Olive Street
SEATTLE, WASH.....917 E. Pike Street
PORTLAND, ORE.....329 Ankeny Street
DENVER, COL..15th & Curtis Streets

100% Perfect

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THE Durable Dayton

21 Makers of Motor Trucks Competed for the Contract of "New York State"

SEVEN 3-ton DAYTON TRUCKS were recently sold to the State of New York, after keen competition with models of twenty-one different motor truck manufacturers.

After strenuous tests, the State Authorities were convinced of the superiority of design and durability of DAYTON TRUCKS.

Durable Dayton Trucks are made in 2, 3 and 5-ton capacity—designed for hard work, heavy duty and continuous service. In design, construction and workmanship, they cannot be surpassed. In actual working service, they cannot be equalled.

It will at least pay you to investigate the DURABLE DAYTON. Our traffic department will gladly submit interesting data covering your delivery and transportation requirements.

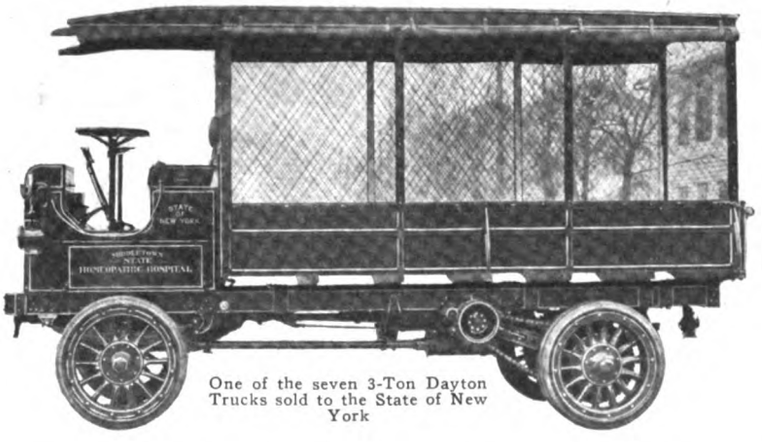
WE DESIRE AGGRESSIVE AND RESPONSIBLE REPRESENTATIVES IN TERRITORY NOT ALREADY CLOSED.

Catalog Mailed for the Asking

Dayton Auto Truck Co.
Dayton, Ohio

Factory Branches
NEW YORK CHICAGO

Responsible Dealers in Most Leading Business Centers



One of the seven 3-Ton Dayton Trucks sold to the State of New York

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Overland

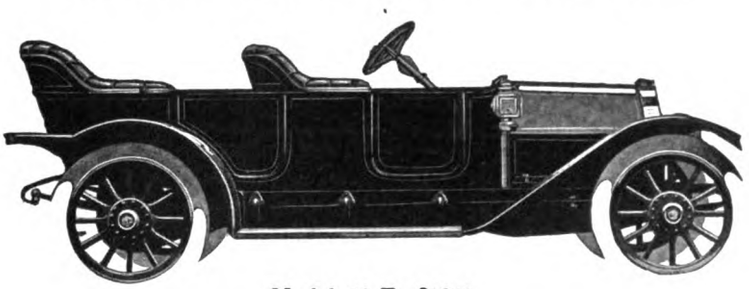
NEARLY twelve months ago we announced the Overland Model 60 at $1200. We had unbounded faith in it. We looked for it to be the big winner of the season.

The clamor for the Model 60 fails to cease as the season ends. No month has seen us make enough. The value of the car is apparent at sight. The more we make the more we increase the demand.

No car of similar value can be found anywhere at the price. Under any other name the Model 60 would cost $1500. Production methods must regulate price. Ours are 95 per cent. efficient. They bring you the Model 60 at a bottom price.

Model 60 is representative of the line it pays each dealer and owner to watch. Write for book I-46.

The Willys-Overland Company, Toledo, Ohio



Model 60-T—$1200

Wheel base, 111 inches; body, 5-passenger fore-door touring; motor 4⅛ x 4½; horsepower, 35; Remy magneto; tires, 34 x 4 inch Q. D.; equipment, three oil lamps in black and brass finish, two gas lamps, horn and generator. Self-Starter, $20 extra.

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THE MOTOR WORLD

Vol. XXXII New York, U. S. A., Thursday, June 27, 1912. No. 1

AMPLEX THOROUGHLY REORGANIZED

Mead Assumes Presidency and Two-Cycle Motor Abandoned—Four-Cycle "Six" and Knight "Four" Replace it.

When T. C. Starritt and H. M. Hovey, the Detroiters who three weeks ago took over the assets and liabilities of the Simplex Motor Car Co., of Mishawaka, Ind., set about reorganizing it under the style Amplex Motor Car Co., they not only reached out in an unexpected direction for the man to assume direction of its affairs but decided to cast out even the two-cycle engine which so long has constituted the Amplex feature.

The man they have chosen to carry on the work is none other than W. J. Mead, vice-president and general manager of the Olds Motor Works, of Lansing, Mich., and one of the vice-presidents of the General Motors Co., of which the Olds establishment is a part. Mead has assumed the presidency and general management of the Amplex company and, vested with full power, he is losing no time in shaping its affairs in new and more profitable directions, bringing to bear the varied experience he acquired, first with the Buick Motor Co., which he joined in 1905, and later with the Olds Motor Works and the General Motors Co. itself, in whose councils he stood high. He has not yet completed the organization of his staff, but it has been definitely settled that the two-cycle motor will be displaced and that the sales and general offices of the Amplex company will be located in Chicago and not in the factory at Mishawaka, which means, of course, that Mead's headquarters will be located in Chicago.

The new productions of the new company will continue to bear the name Amplex, but there the resemblance to the models of the old company will end, for, as stated, the two-cycle engine hitherto associated with the name has been cast out bodily and for it will be substituted not only a six-cylinder, long-stroke, four-cycle, poppet valve engine, but there also will be included in the Amplex line a Knight-engined model, of which latter, however, only a limited number will be manufactured. That they will be high grade productions goes almost without the saying.

Hutchinson Assumes Olds' Management.

To fill the vacancy created by the resignation of W. J. Mead, who is to become president of the Amplex Motor Car Co., of Mishawaka, Ind., Oliver C. Hutchinson has been promoted to the office of vice-president and general manager of the Olds Motor Works, Lansing, Mich. Hutchinson, who for several years served as sales manager for Thomas B. Jeffery & Co., of Kenosha, Wis., was appointed manager of the Marquette company, of Detroit, some two years ago and the measure of his success with the Marquette car, which is the newest in the General Motors group, is best evidenced by his elevation to importance in the pioneer Olds establishment.

Speedwell to Produce Knight Model.

Although the car has been in use for several months, it just has become definitely known that the Speedwell Motor Car Co., of Dayton, O., will include a Knight-engined model in its forthcoming productions. It will make use not only of the Knight engine but a worm gear also and will list at $4,000. As the Speedwell company is not a Knight licensee, it naturally will purchase its engines from outside sources and put to them such extra touches as its experience indicates are necessary or advisable. A six-cylinder car also will be added to the Speedwell line, which serves as the best answer to unfounded reports that the company purposed abandoning pleasure cars for the manufacture of motor trucks.

Studebaker Shares Now "On 'Change."

The governors of the New York Stock Exchange yesterday approved the listing of the shares of the Studebaker Corporation. Hitherto the stock has been dealt in only on the curb market.

GASOLENE MOUNTS STILL HIGHER

Regular Monthly Increase Brings it to 16 Cents, an Advance of 78 Per Cent.—Meanwhile Quality Deteriorates.

Good old Supply and Demand, who are the best friends ever had by any corporation that ever raised a price, have continued their labors for the Standard Oil Co. Yesterday, 26th inst., they again tested their inflating apparatus and, presto! the price of gasolene at once rose to 16 cents per gallon, which, according to some statisticians, is the highest quotation since the Civil war; it certainly is the highest since Standard Oil's memorable "engagement" with Uncle Sam last year, which decided it to go through the motions of "dissolving." Only about six months ago the fuel was selling at 9 cents per gallon.

Supply and Demand always have worked industriously for the Standard Oil Co., but never more industriously than during the past half-year, within which period the price of automobile fuel has been advanced 78 per cent. They are such skillful workers that few can follow their operations, but apparently they have decided that an advance of about 1 cent per gallon per month is best for the health and enormous dividends of their particular patron, and they have acted accordingly. For each month since January last 1 cent has been added to the price; but not always has the increase attained publicity. On May 13th, for instance, it became known that the price had advanced from 13 to 14 cents; on the 25th of the same month it was advanced from 14 to 15 cents, but the latter inflation was so quietly performed that it did not become generally known.

There are those who maintain that even the increase of 78 per cent. but poorly represents the real advance, for these people —and they are numerous—insist that as the price has gone up the quality has gone down; certain it is that once self-respecting automobiles of late have acquired a thirst

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that requires very much more gasolene to assuage.

Few of those who purchase gasolene are given to testing its quality, but the garage committee of the Long Island Automobile Club has kept track of such things and has found that the gasolene purchased from outside garages is giving 50 per cent. less mileage than the fluid which it purchases and supplies to its members.

At the offices of the Standard Oil Co. they pay a genial gentleman something like $20,000 a year to "explain things" to newspaper men and other callers. His efforts to explain the advance in the price of gasolene are visibly painful, however. The gentleman knows little regarding production and quality, and when price is mentioned he merely presses a button in his interior and, forthwith, Supply and Demand appear on the scene. They are rollicking, good-natured chaps, but unfortunately they are deaf and dumb, and as they appear only to disappear, it requires a magician to find their abiding place.

From other sources saturated with Standard Oil, however, more real information is obtainable, but not concerning prices, which are given to them but to obey. These sources admit that not all of the gasolene sold is "up to test," or of a quality such as once was generally dispensed. But the fault lies, not with Standard Oil fuel, but, if you will believe it, with the fuel supplied by other and smaller companies, some of whom, it is declared, are supplying gasolene which tests but 59°. Standard Oil itself, however, supplies several grades of gasolene. That which is commonly supplied to garages—and which now is sold to them at 16 cents per gallon—is supposed to be about 67°, but no guarantee attaches to it. It is stuff that is commonly known as "autonaphtha" and "stove gasolene." The same article sold in wood barrels to other than garages now stands at 18¾ cents per gallon, and 17 cents in steel barrels; 68° to 70° gasolene in the same receptacles sells for 20 and 18 cents per gallon, and 70°-72° for 21 and 19 cents, but the latter grades are not in general use and are supplied only when specified. These prices are those that prevail since the 1 cent was added yesterday, and which are likely to prevail until Supply and Demand trot out next month.

Failure to File Report Brings Suit.

Because the Auto Robe and Rubber Co., of 13 East 16th street, New York city, failed to file its corporation return for the year 1910, suit for $10,000 is being brought against it in United States District Court for the Southern District of New York. The Federal Government is prosecuting the action.

B. M. O. Truck Changes its Title.

The B. M. O. Motor Truck Co., of Cleveland, O., has changed its name to the Standard Motor Truck Co. The necessary certificate has been filed with the state authorities.

WARM WORDS PASS AT "A" MEETING

Promoters of Pacific Coast "Independence" Turn on Accusers—Many Shares Are Sold but Few Paid for.

Lack of warmth and animation did not characterize the annual meeting of the much-troubled "A" Automobile Co., of Sacramento, Cal., when it occurred last week in the offices of the promoters, Cooke & Remmers, in San Francisco. Three attorneys, representing the dissatisfied stockholders, were present, fortified with the proxies of those whom they represented, but only one of the lawyers was admitted to the meeting, the others being excluded because their proxies were declared to be not in proper form; the one who obtained admission, however, made things sufficiently interesting.

F. T. Cooke presided at the meeting, but most of the talking was done by his partner, Remmers, who got into several violent altercations with M. L. Haines, the attorney who obtained admission and who had been seeking to bring about the arrest of the promoters on a charge of fraud. Remmers, it is stated, several times declared that he would "get" Haines yet. He also referred bitterly to the refusal of the Sacramento Chamber of Commerce to endorse his project and avowed that it would yet regret its action, predicting that within six months "A" automobiles would be running on the streets of Sacramento, as visible evidence that the Pacific Coast can be independent of Eastern factories.

Some 315,000 shares were represented at the meeting, but it was brought out that only 57,610 had been paid for in full. The Cooke-Remmers interests controlled the election, however, and chose directors as follows: E. C. Collins, F. T. Cooke and N. C. Norton of San Francisco; E. C. Schelhaus of San Francisco; J. F. Cooke of Sacramento; James Hall of Watsonville, and Charles Kraus of Santa Rosa. They also were instrumental in having introduced a resolution aimed at the dissatisfied stockholders and the newspapers which had given publicity to "A" affairs, and which also declared that Cooke and Remmers "have always done their duty and have been honest and conscientious, and their integrity is believed in."

While the meeting was in progress, Remmers was under citation for contempt of court for ignoring a subpoena to give a deposition in one of the several suits brought by dissatisfied stockholders.

Gillard Goes Higher on Pullman Ladder.

After serving three years in a minor capacity, Ernest T. Gillard has been promoted to the post of factory manager of the Pullman Motor Car Co., of York, Pa. Although but twenty-eight years of age, Gillard, who is a French engineer, has enjoyed extensive experience, having been attached to the engineering staffs of the Renault, Darracq and Moto Bloc establishments, Gillard's uncle being president of the last named company. Gillard has to his credit also the highest scholarship, won at the Geneva Institute in Switzerland, both as a mechanical and technical engineer. The Pullman line for 1913, however, will be marked by little, if any, change. One model will be eliminated, but the other current productions were so late in making their appearance that President O'Connor states that they were to all intents and purposes designed for the 1913 market.

"Clink of Gold" Nets 26 Per Cent.

According to the report of the receiver, the general creditors of the American Automobile Mfg. Co., of New Albany, Ind., which in grandiloquent style sounded the "clink of gold" in the ears of investors, will receive a dividend of 26 per cent. as a result of the recent sale of the company's property. The general creditors will include six stockholders who paid the 20 per cent. assessment on their shares which was levied several months ago. Other stockholders will receive nothing. When the property was sold by the receiver it was bid in by L. A. Boli, one of the heads of the old company, who represented the American Automobile Corporation, which is designed to continue the business. He paid $17,500 for the plant, and also assumed the mortgage and certain taxes and small claims which brought the price to about $45,000. The American Automobile Mfg. Co. was woven around the Jonz car, which was born in Nebraska, where, however, it failed to flourish. Removal to Indiana did not add to its health, despite one of the most florid stock selling campaigns ever instituted.

Sub-Dealership Lawsuit Compromised.

Although the basis of settlement was not made public, the suit brought against Frederick and Nicholas Koenig, Jr., brothers, of Tarrytown, N. Y., by the Overland Sales Co., of New York City, and later conducted with the Silver Motor Co. as complainant, was compromised and settled out of court late last week as it was about due for trial in Supreme Court for New York County. The action was based upon a claim that, after signing up as Overland sub-dealers under the complaining company the Koenig brothers did not live up to their contract, and on notes and other matters owed the complainant $948.93. The change of complainants was due to the fact that the Overland Sales Co. has become the C. T. Silver Motor Co.

Kingman Returns, His Health Restored.

After an absence of many months in Europe, in search of health, John A. Kingman, advertising manager of the Locomobile Co. of America, with which he has been connected since its organization in 1899, returned home late last week. He is again at his desk and in good health.

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FORD "GOES FOR" A PRICE CUTTER

Charging Fraud and Deceit and Unfair Dealing, Asks $50,000 Damages—Patent Rights Also Brought to Bear.

Trifling with the price of Ford cars has resulted in the Union Motor Sales Co., of Dayton, O., being called into the Federal court in Cincinnati to explain its action and to defend itself in a suit for $50,000 damages instituted by the Ford Motor Co., of Detroit. The Sales company is composed of Lucien A. Howard, J. Carl Horton, Earl S. Sorsley and William Yokum, all of whom are named in the complaint.

The Union Sales company is one of the kind which has professed to be able to supply cars and parts thereof, Fords among others, at less than list prices; but, apparently as a measure of self-protection, the Dayton institution has required that all prospective purchasers of cars acquire a share of its stock, which was sold for the more or less modest sum of $10.

In its complaint, the Ford company alleges that it is possible only by fraud and deceit for other than its own licensees to procure its cars and other parts, and that the Union company has employed this means in violation of the Ford patent and other rights and to the damage of its business.

Alleging unfair business dealing in violation of its patent rights, and in addition to asking for $50,000 damages, the Ford company asks for the usual injunction and accounting. July 1st has been set as the date for hearing arguments, and as Ford's method of attack includes some unusual points, the result cannot fail to prove of widespread importance.

Want Money Back from "Auto Owners."

Early J. Speck and P. B. Gill, of Cleveland, O., are two more of the many men who have had to do with so-called autobile owners' organizations who have repented of their bargains. As a result of their repentance, they have instituted suit in that city to recover $2,000, which they say they have invested in the Auto Owners' Association, which they further allege promised them commissions on all membership stock sold and a percentage of the profits accrued from the vulcanizing operations of the so-called association's Cleveland branch at 2362 Euclid avenue, of which they were in charge. In their complaint, they allege that the promises were not carried out.

Castle Lamp to Go to Kalamazoo.

Richmond, Ind., which fancied that it had secured the Castle Lamp Co., was too previous in sending out reports to that effect. The Richmond deal fell through, and, instead, the Castle Lamp Co., which at present is located in Amesbury, Mass., will remove to Battle Creek, Mich. where it has purchased outright a large, modern, fireproof factory building, affording 75,000 square feet of floor space. It is the intention of the Castle company, which is one of John N. Willy's properties, to so equip the structure that it will stand as one of the best appointed automobile lamp producing plants in the country. Fred E. Castle, the active head of the business, will remove to Battle Creek and assume personal charge of operations.

Ford to Enlarge its Canadian Plant.

Reflecting the prosperity of the American company, the Ford Motor Co. of Canada has purchased a site adjoining its plant in Walkerville, Ont., on which immediately will be erected a four-story structure 75 x 510 feet. When this building is completed, the Ford Canadian plant will have 70,000 square feet of floor space, which will permit of the employment of about 2,000 men. The new structure will be so equipped as to permit of the complete manufacture of Ford cars, and thereby lessen the volume of assembling which now is done and make the Canadian establishment a factory in the full sense of the word.

Miss Knight Forms New York Company.

To better advance the interests of the K-D crescent valve motor, the K-D Motor Co. has been incorporated under the laws of New York with an authorized capital of $100,000. Miss M. E. Knight, the inventor of the motor, is president of the new company; Mrs. A. M. Davidson, the vice-president, and Miss B. M. Davidson, secretary and treasurer. For the time being, the offices of the company will remain in Boston, but headquarters shortly will be established in New York.

Hoyt Retires from Pope Directorate.

Colgate Hoyt, the New York banker, has resigned as a director of the Pope Mfg. Co., of Hartford, Conn. His resignation was due wholly to the fact that the meetings of the board of directors now are held in Hartford instead of New York, and that he cannot find it convenient to make the journeys between the two cities which his attendance requires.

Siebert Prepares to Build More Trucks.

Fred L. Siebert, a Toledo (O.) carriage maker who has been building motor trucks on a small scale, is making ready to enlarge the latter department of his business. To that end he has secured the necessary permit to erect a three-story factory, 75 x 118 feet, on Southard street.

Receiver Named for Flint Body Company.

Robert H. Cook, vice-president and secretary of the Flint Body Co., of Flint, Mich., has been appointed receiver for that concern. The company, capitalized at $50,000, was incorporated January 1, 1909. William B. Stewart, president and treasurer, is also the principal stockholder.

HOT SHOT FROM GREASE GUN MAKER

Rubly Has Judgment Reopened and Throws Light on "35%" Methods—"Export Order" Termed "Trick and Device."

Although on May 25th last the 35% Automobile Supply Co., of New York, obtained a judgment in the Supreme Court for New York County for $2,383.30 against William Rubly, of Tuckahoe, N. Y., it has not yet collected the money. It is possible that it may never collect it; for, on the application of Rubly, the case has been reopened and he has set up a counter claim for $44,000. His amended answer is of the sort that indicates that his fighting blood is up and throws light on the ways of the 35% people.

It makes it appear that when judgment against Rubly was entered the suit had dragged 15 months before it came to trial, the 35% company becoming insistent when, in the picturesque language of Rubly's new lawyer, Holmes Jones, which is on file in court, the plaintiff knew "there was crape on the defendant's doorbell," which is designed to convey that when the case was called for trial, Rubly, because of the death of his mother, was unable to put in an appearance.

The action is one of several which grew out of the more or less remarkable contract whereby the 35% company, in return for specified sums accepted in the form of merchandise, agreed to advertise the wares in a so-called monthly catalog. Rubly, who manufactures grease guns, was one of those who signed the agreement, but he states in his amended answer that it was represented to him that the monthly catalog would be "a booklet" of neat, attractive and dignified appearance, "printed on good, heavy paper" and such as ordinarily would be preserved for reference. He further alleges that he was assured that it would have a circulation of not less than 60,000 copies per month in all parts of the United States and Canada, and that at least 5,000 copies would be mailed to dealers. He was told also, he says, that the number of those whose goods would be represented in the catalog would be limited to eight or nine, and was shown what purported to be a contract with George A. Haws and two other manufacturers, apparently as evidence of the 35 percenters' "good faith." When the so-called booklet appeared and Rubly found it to be merely a handbill, printed on cheap paper and offering for sale 60 or 70 different articles instead of the eight or nine, none of which were made by George A. Haws, and having been informed that the handbill did not enjoy a good reputation and was not given the circulation claimed for it, and after complaining unavailingly of the quality of the "handbill," he ordered the contract canceled and notified the 35% Automobile Supply Co. to discontinue ex-

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hibiting or printing any advertisement of the Rubly grease guns.

When this occurred, he had delivered $259 worth of the grease guns under the contract, and part of an order for 1,250, to the value of $2,106, which order, Rubly alleges, the 35% company represented was designed for export, in order to permit them to be sold at the jobbers' price. This alleged export order, however, Rubly describes as a "trick and device" and he, therefore, refused to complete it and the 35% company in turn refused to pay his bill.

Acting under his right as the owner of patent No. 966,861, covering his grease gun, Rubly states that at the time he entered into the contract with the 35% Automobile Supply Co. he fixed the list price at which the grease guns were to be sold at retail and the discount which was to be given to dealers. He claims, however, that the 35% company sold his grease guns at much less than the agreed price "with intent to injure, defraud, damage and destroy his market in the United States," and thereby lost to him a contract into which he had entered with a responsible corporation and which provided for the purchase by the latter of at least 5,000 grease guns per year during the life of the patent. For this loss and for other damages sustained, Rubly sets up a counterclaim of $44,000.

The Supreme Court having granted Rubly's petition to reopen the suit, it has been restored to the calendar for trial.

Shelbyville Demands Return of Property.

Trustees of the Citizens' Industrial Association, of Shelbyville, Ind., have filed suit against the Clark Motor Car Co., of that city, for liquidated damages and foreclosure of mortgage, demanding $26,000. The plaintiff asks the title to land and a manufacturing plant turned over to the company two years ago. It is alleged that the company agreed to employ one hundred men for five years, beginning ninety days after the plant was in operation, and has failed to keep the agreement, and has been closed for three months. The efforts of J. Oscar Hall, as trustee in bankruptcy for the Clark company, to recover $7,955 from the wreck came to naught, the suit, which he brought against the Farmers' National Bank, of Shelbyville, to recover that amount having been dismissed by the Federal Court last week. Hall alleged that the Clark company had paid to the bank $7,955 and thereby made a preferential payment.

Body Builders Overcome at Fire.

Considerable damage was done and three officers of the body building concern, the Gregg-William D. Rogers Co., of Philadelphia, Pa., were overcome by smoke when fire broke out last week in their four story factory, at 1926-34 Arch street. The damage was heavy. The men who had narrow escapes when heavy clouds of smoke suddenly filled the building were Vice-President Eugene C. Everhart. Secretary James C. Rabb and Treasurer Frank W. Shriver.

OVERLAND STAFF IN CONVENTION

No Steam-Roller Methods, but a Formal Program Well Arranged—Play that Lightened Serious Side.

Carrying the real idea involved in the word convention a little closer to its logical conclusion than is usual, the first district manager's convention of the Willys-Overland Co., Toledo, was brought to a successful close on Saturday last, 22d inst. It was in making of the convention a veritable school of instruction in a variety of subjects connected with the manufacturing and marketing of automobiles that the real meaning of the word was more nearly approached and the gathering made of real value to both the officers of the company and the district managers who convened and enjoyed the hospitality of the company at the convention hall in the big Toledo factory.

Three days were spent by the body of department heads and district managers in listening to papers read and words of advice from those who are in a position to see all the field at once and thus choose specifics that will prove of mutual advantage in increasing business. Following "A Word of Welcome" delivered by assistant sales manager C. S. Jameson, on Thursday morning, 20th inst., a trip was made through the big Overland and Kinsey plants. Later, factory manager Harry Shepler addressed the gathering, the subject of his talk being "The Factory and What it is Doing, New and Special Machinery, and What Has Been Accomplished." This was followed by a talk on "Laboratory Tests," by Consulting Engineer Carl Neracher, and the day was rounded out by a speech from assistant sales manager H. B. Harper on "What We Shall Expect of District Managers for 1913 and the Handling of Territory and Dealers." Dinner was served at the Hotel Secor and a theater party closed the day's activities. A very similar program was carried out on Friday and was followed by a smoker at the Overland Club on Maumee Bay.

One of the unusual features of the gathering was the presence of an immense Remy magneto which occupied a prominent place in the Convention Hall. At least it closely resembled a Remy magneto, though in reality it was very far removed from being a spark producing instrument. Despite its highly suggestive appearance, it was nothing other than a water cooler. Whether or not sparkling water was cooled is not a matter of record.

On Saturday the program was much the same, the meeting being addressed by Fred S. Andrews and Martin V. Kelly. Following the addresses, luncheon was served at the Toledo Yacht Club, and afterward motor boats belonging to members of the yacht club were requisitioned and a sail on the lake enjoyed. Following the boat ride, the convention was closed with a banquet at the yacht club.

Taxicab Venture Cost Backer $2,000.

Believing from his own experience with Jersey City trolley cars that a taxicab service would be a paying investment in that place, George Lapp, so the complainants allege, promoted the Hudson City Auto Exchange, and as a result is the debtor in a judgment filed this week by the Diamond Rubber Co. of New York for $2,000 in Supreme Court for New York county. The rubber company claimed that Lapp, stating he was financially interested in the new company, agreed to stand sponsor for its credit with the rubber company to the extent of $2,000. When the bill reached $2,184.55 credit was suspended and action taken to collect $2,000 of the amount from Lapp. Wilbur F. Lyon, a Diamond salesman made affidavit to Lapp's conversation as to his reasons for starting the business, citing the poor trolley service.

Ford, "Sold Up," Refuses Further Orders.

When, early this year, the Ford Motor Co., of Detroit, announced that it would produce 75,000 cars during the current season, it appeared such a tall order as to cause some headshaking in the trade. That the company's faith both in the demand that existed and in its ability to produce such an enormous number of cars was well founded is indicated by the fact that the company has served notice on its dealers and branches that it is utterly impossible for it to accept further orders for delivery previous to September 1st next. The company naturally expresses its regret, but states that neither importunate letters nor visits to the factory will serve to alter the situation or result in a show of favoritism. The Ford company is simply "sold up," and that is all there is to it.

Cleveland Branch for Republic Tires.

The Republic Rubber Co., of Youngstown, O., manufacturer of Republic staggard tread tires, has opened a branch at 5919 Euclid avenue, Cleveland. Ben C. Swineheart, who for the past three years has been head of the truck tire sales department of the company, will have charge.

Mitchell Agency Gets Judgment.

Judgment for $311.34 was secured last week in Supreme Court for New York county against the Morgan-Swan Taxicab Co., of New Rochelle, N. Y., by the Mitchell Motor Co., of New York City. The amount involved was claimed on a note given by the defendant.

Victor Top Reaches Over a Rival.

The Victor Buggy & Auto Top Co., 1545 North Broadway, St. Louis, Mo., has absorbed the business of the L. E. Lueschaw Co., of the same city. The activities of the enlarged company will be devoted to the production of tops, seat covers and cushions.

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Chicago, Ill.—Bon-Ton Garage Co., under Illinois laws, with $10,000 capital; to operate a garage. Corporators—G. Mead, T. Behr, Daniel W. Fishell.

Cuero, Tex.—R. C. Flick Auto Co., under Texas laws, with $10,000 capital; to deal in motor cars. Corporators—R. C. Flick, R. F. Flick, N. M. Crain.

Columbus, Ohio—Motz Oil and Gas Co., under Ohio laws, with $30,000 capital. Corporators—B. C. Kelsey, W. J. Keever, G. L. Wheeler, J. A. Zerkel, J. H. Motz.

Niagara Falls, N. Y.—Esco Sales Co., under New York laws, with $10,000 capital; to deal in motor cars. Corporators—Joseph Doysmith, Spencer Parker, Chris Gombart.

Chicago, Ill.—Chicago Tire Filling Co., under Illinois laws, with $2,500 capital; to manufacture tire filler. Corporators—Edgar W. Billard, Fred P. Updike, Clarence L. Jackson.

Syracuse, N. Y.—Mohawk Tire Co., under New York laws, with $6,000 capital; to deal in tires. Corporators—Henry J. Moses, Winifred J. Rice, Clarence B. Rice, all of Syracuse.

Pine Bluff, Ark.—Pine Bluff Motor Car Co., under Arkansas laws, with $1,000 capital; to deal in motor cars. Corporators—John F. Rutherford, C. H. Vaughan, W. J. Lockwood.

Chicago, Ill.—Dearborn Automobile Co., under Illinois laws, with $10,000 capital; to deal in motor cars. Corporators—Sidney Oppenheim, Arthur Rosenthal, John G. Ahrensfield.

San Francisco, Cal.—Arctic Auto Accessory Co., under California laws, with $100,000 capital; to deal in motor supplies. Corporators—G. T. Montgomery, G. B. Keane, A. C. Keane.

Grand Rapids, Mich.—East End Auto Co., under Michigan laws, with $10,000 capital; to deal in motor cars. Corporators—Rial W. McArthur, Walter C. McGrath, Silas B. Sisson.

Lynn, Mass.—Seymour Avenue Garage, Inc., under Massachusetts laws, with $25,000 capital; to operate a garage. Corporators—Charles R. Sibley, John E. Moulton, Ellery Jeffts.

Chicago, Ill.—Scientific Auto Tube Co., under Illinois laws, with $200,000 capital; to manufacture tire tubes. Corporators—Ralph E. Cruzen, Howard W. Lewis, Herschel V. Shepard.

Nashville, Tenn.—American Tire and Vulcanizing Co., under Tennessee laws, with $10,000 capital; to deal in and repair tires, etc. Corporators—J. Brenner Fletcher, H. E. Elliott and others.

Los Angeles, Cal.—Los Angeles Dry Battery Co., under California laws, with $25,000 capital; to manufacture batteries. Corporators—Fritz Heine, Carl Jaeger, Elmer E. Morgan and others.

Newark, N. J.—Newark Auto Truck Mfg. Co., under New Jersey laws, with $500,000 capital; to manufacture commercial motor vehicles. Corporators—L. W. Babbage, H. H. Poole, J. T. Walsh.

Chicago, Ill.—Jones Electric Starter Co., under Illinois laws, with $10,000 capital; to manufacture electric motor starters. Corporators—Charles H. Roth, Edward L. Jones, Gustav A. Roth.

Springfield, Ill.—Stadium Motordrome Co., under Illinois laws, with $24,000 capital; to build and manage a motordrome. Corporators—Jerome J. Cermak, James S. McClellan, Harry Okin.

Babylon, N. Y.—Babylon Garage Co., under New York laws, with $500 capital; to operate a garage. Corporators—Charles H. Duryea, William E. Sprague, Annie M. Sprague, all of Babylon.

Newtown, Conn.—Premier Mfg. Co., under Connecticut laws, with $10,000 capital; to manufacture automobile accessories. Corporators — Alfred C. Griscom, Julius Hartwig, Louise Hartwig.

Indianapolis, Ind.—Ideal Motor Car Co., under Indiana laws, with $100,000 capital; to manufacture motor cars. Corporators—H. F. Campbell, H. C. Stutz, W. D. Myers, W. F. Glickert, E. L. Dupree.

Buffalo, N. Y.—Stewart Motor Corporation, under New York laws, with $250,000 capital; to deal in motor cars. Corporators—Charles J. Bork, Bernhard L. Fischer, William Strasmer, all of Buffalo.

Wyoming, Ohio—Wyoming Automobile Co., under Ohio laws, with $10,000 capital; to deal in motor cars. Corporators—Rolla L. Schickner, George Eversman, William Fetzer, P. F. Davidson, C. I. Sears.

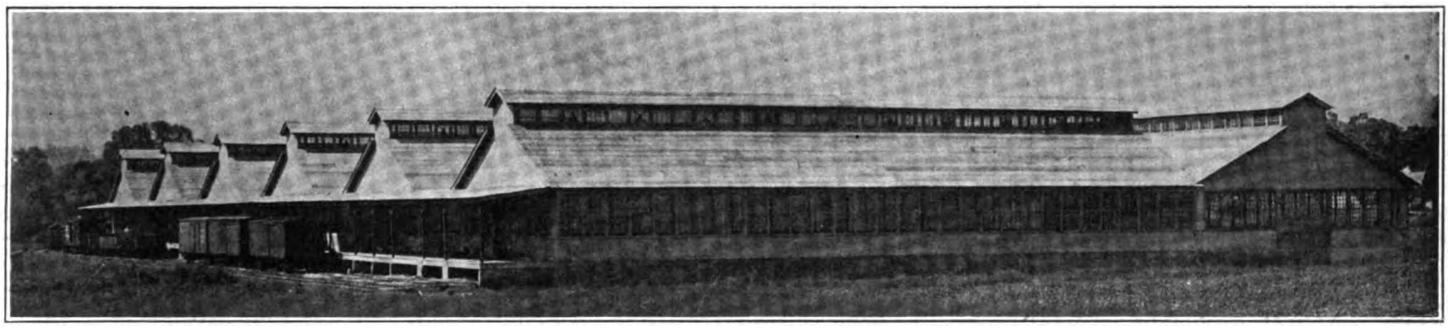
Indianapolis, Ind.—Consumers' Carbide Gas Co., under Indiana laws, with $100,000 capital; to manufacture acetylene gas generators—O. K. Stuart, A. J. Schmidt, Robert Clark, C. W. Scoggin, N. J. McGuire.

Columbus, Ohio—Everitt Auto Sales Co., under Ohio laws, with $30,000 capital; to deal in motor cars. Corporators—Horace K. Dobson, Amos F. White, Elmer F. McConah, H. H. Kellenberger, A. W. Raving.

Scituate, Mass.—Egypt Garage and Machine Co., under Massachusetts laws, with $6,000 capital; to operate a garage and machine shop. Corporators—William E. Chafin, Charles M. Litchfield, Charles W. Peare.

Mansfield, Ohio—Mansfield Foundry & Casting Co., under Ohio laws, with $10,000 capital; to operate a foundry. Corporators—Harry L. Krumm, Oscar C. Jacob, Sarah E. Krumm, Helen M. Jacob, Arthur C. Jacob.

New York, N. Y.—Wait's Motor Van & Storage Co., under New York laws, with $25,000 capital; to operate a motor delivery. Corporators — Francis T. Germain, Philip J. Dunn, Louis Burgess, all of 15 Broad street.



PENN MOTOR CAR CO.'S RECENTLY-COMPLETED FACTORY AT NEW CASTLE, PA.

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Toledo, Ohio—Walker Tire Chain Co., under Ohio laws, with $150,000 capital; to manufacture motor car accessories. Corporators—Henry F. Rohman, Charles A. Newman, Charles P. Eger, A. M. Edwards, George C. Bryce.

New York, N. Y.—Long Acre Garage, Inc., under New York laws, with $1,500 capital; to operate a garage. Corporators—Louis M. Borden, George Gulbranson, both of 384 Fifth avenue; Joseph F. Taylor, 215 Fourth avenue.

Cincinnati, Ohio — Commercial Motor Sales Co., under Ohio laws, with $10,000 capital; to deal in automobiles. Corporators—Walter K. Vosler, George Schorr, Edward H. Hoelscher, William G. Hoelscher and George J. Slaline.

New York, N. Y.—Harlem River Garage and Repair Co., under New York laws, with $900 capital; to operate a garage. Corporators—Edward Meltzer, 55 East 188th street; Frank D. Tice, 1717 Madison avenue; William D. Hookey, 202 West 130th street.

New York, N. Y.—K.-D. Motor Co., under New York laws, with $100,000 capital; to manufacture motors. Corporators—Margaret E. Knight, South Framingham, Mass.; Anna F. Davidson, Beatrice M. Davidson, both of 259 Union avenue, Saratoga Springs, N. Y.

Dayton, O.—Veitch Motor Manufacturing Co., under New York laws, with $200,000 capital; to manufacture motors, motor cars, etc. Corporators—James S. Harris, 126 Liberty street; Percival J. McIntosh, 171 West 70th street; Charles H. Toy, 61 Bainbridge street, Brooklyn.

New York, N. Y.—Henry Engineering Co., under New York laws, with $20,000 capital; to manufacture motor parts. Corporators—George L. Henry, 612 West 138th street; Harry W. Badenhausen, 158 West 2d street, Mount Vernon; Myron F. Hill, 1 Kress Park, New Rochelle.

New York, N. Y.—Creuzbauer Non-Exhaust Motor Co., under New York laws, with $20,000 capital; to manufacture motors. Corporators—William H. Price, 801 Prospect place, Brooklyn; Edgar F. Woodward, 30 Church street; W. Harry Sefton, 168 Montague street, Brooklyn.

Changes of Capital Stock.

Cleveland, Ohio—Westman Motor Truck Co., from $200,000 to $15,000.

Indianapolis, Ind.—Henderson Motor Car Co., from $100,000 to $200,000.

Changes of Corporate Names.

Indianapolis, Ind.—Fisher-Gibson Co. to Gibson Automobile Co. .

Cleveland, Ohio—Park Motor Car Co. to Park Motor and Mfg. Co.

Charleston, S. C.—Robinson Auto Co. to Charleston Motor Sales Co.

Cleveland, Ohio—B. M. O. Motor Truck Co. to Standard Motor Truck Co.

N. A. A. M.'S NEW TRUCK GUARANTEE

Tenure and Spirit the Same but Language More Specific than Former Warranty—How the Two Compare.

After long deliberation and consideration, such as is consistent with the importance of the subject, the National Association of Automobile Manufacturers, Inc., finally has found fitting phraseology for a standard truck guarantee and has adopted it. Though the wording is slightly changed as compared with the tentative form recommended for adoption at the March meeting of truck manufacturers, the spirit is the same. As compared with the former standard guarantee, however, which was adopted May 4, 1910, there is considerable difference, the chief point being that the new guarantee flatly repudiates any responsibility in cases of defects in vehicles that have been driven at speeds in excess of the rated speed, or loaded in excess of the factory rating. The old guarantee did not go to this length.

The period of the guarantee remains unchanged at 90 days, and the old clause withholding guarantees from tires and rims has been extended to cover specifically all trade accessories—"tires, rims, ignition apparatus, lamps, gas tanks, signalling devices, generators, batteries or other trade accessories." Taken as a whole, the new form of guarantee embodies precisely the same ideas as the old one, but it has been found necessary to go into considerable detail in order to avoid misunderstanding. The old guarantee, for instance, covers defects occurring "under normal use and service," while the new warranty goes deeper and defines some of the things that are not considered "normal use and service,"—that is, overloading and overspeeding.

It is recommended by the N. A. A. M. that all manufacturers of commercial vehicles make this their standard guarantee, print it in their catalogues and make it a part of all contracts of sale, either by printing it on the contract or by making specific reference to the guarantee as printed in the catalogue, as the "standard motor truck warranty of the National Association of Automobile Manufacturers, Inc."

The wording of the guarantee is as follows:

We warrant the new motor trucks manufactured by us to be free from defects in material and workmanship, this warranty being limited to making good at our factory any part or parts thereof which shall, within ninety (90) days after delivery of the truck to the original purchaser, be returned to us with transportation charges prepaid, and which our examination shall disclose to our satisfaction to have been thus defective.

This warranty shall not apply to any truck which shall have been repaired or altered outside of our factory in any way, so as, in our judgment, to affect its stability or reliability, nor to any truck which has been operated at a speed exceeding the factory rated speed, or loaded beyond the factory rated load capacity, or which has been the subject of other misuse, negligence or accident.

We make no warranty whatever in respect to tires, rims, ignition apparatus, lamps, gas tanks, signalling devices, generators, batteries or other trade accessories, inasmuch as they are usually warranted separately by their respective manufacturers.

The foregoing obligation to make good any defective parts returned as herein provided is in lieu of all other warranties expressed or implied, and of all other obligations or liabilities on our part, and we neither assume nor authorize any other person to assume for us any other liability in connection with the sale of our trucks.

Lozier's Attitude in Respect to Trucks.

Reports to the effect that the Lozier Motor Co., of Detroit, had decided to abandon the production of trucks until the market acquired a more inviting tone, are denied by President H. A. Lozier himself. Although a Lozier 5-ton truck was exhibited at the national shows last January, it appears that that indication that it had been formall launched was misleading, as Lozier states that his company really never has engaged in truck production. At one time it was hoped to begin deliveries in May, but when that was found to be impossible the Lozier agents were notified that probably no deliveries would be made until December or January next, because of the demands made on the factory by the call for Lozier cars. Apparently some of the Lozier representatives placed a wrong construction on these advices from headquarters by assuming the company had abandoned truck manufacture until further notice.

George H. Day's Son a Typhoid Victim.

Frank P. Day, manager of the Locomobile branch at Atlanta, Ga., died in that city on June 15th of typhoid fever. Day was the son of the late George H. Day, one of the pioneers of the industry and a founder of the Association of Licensed Automobile Manufacturers, and was connected with the Locomobile company for seven years, six of which were spent in the sales department in the factory at Bridgeport, Conn., and the other in Atlanta. Day is survived by his wife.

Rhineland Opens Office in Chicago.

The Rhineland Machine Works Co., of New York, has opened a branch office and stockroom at 1254 Michigan avenue, Chicago. It will be in charge of D. D. Davis, who has represented the Rhineland interests in the Middle West, and will at all times carry a full stock of the imported Rhineland and R. B. F. bearings.

G & J to Erect Another Big Building.

The G & J Tire Co., of Indianapolis, has purchased a site on East Georgia street, adjoining its present factory, on which will be erected a five-story fireproof building, 220 x 170 feet. The estimated cost of the building is $100,000.

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THE WEEK'S INCORPORATIONS




A. Korte has opened a garage in Collins, Iowa.

Edgar Behdee has opened a garage in Sladbrook, Ia.

C. W. Spencer has opened a garage in Lake View, Ia.

Boe & Uhlig is the style of a new garage firm in Soldier, Ia.

F. Downen has opened a repair shop and supply store in Carmi, Ill.

B. Martin is about to engage in the garage business in Temple, Tex.

Caywood Bros., of Raymond, Kan., have bought the Pursley & Wolley Garage.

The Flatonia (Tex.) Automobile Co. has bought out the Reliable Auto Repair Shop.

T. P. Scott, of Remsen, Ia., has purchased the automobile business of Hatz & Wictor.

H. F. Vollmer is having a garage built at Grand avenue and 17th street, Los Angeles, Cal.

Fiatt Bros., of Glennville, Minn., are making preparations for the erection of a garage.

The Standard Garage has opened up in Marietta, O.; Clarence Polen is its manager.

Charles Pavik and Dr. Heathman have opened a garage on Main street, Havelock, Iowa.

Frank D. Maltby has opened a garage at 370 West Main street, Battle Creek, Mich.

Frank Seaman of Ashland, Mich., is about to embark as a garageman; his building will be 100 x 60 feet.

Lute Peterson, who recently erected a garage in Buck Grove, Ia., has sold out to Herman Newbaum.

J. M. Dunn and Parker Bennett, of Bakersfield, Cal., have bought the Mason & Flickenger Garage.

Fred H. Williams of Brookline, Mass., is having a garage erected on Beacon street; it will be 150 x 80 feet.

Floy Francis of Moundville, W. Va., has sold his agencies and garage to R. F. Chisler of Fairview, in the same state.

S. Hables of San Francisco, Cal., has secured the Marathon agency, adding one more to the list of dealers in that city.

Stanley Blas of Sacramento, Cal., has launched out as a dealer; he handles the Franklin and is located at 169 M street.

The manufacturers of the Ames car, located at Owensboro, Ky., have opened a branch at 2437 Michigan avenue, Chicago.

G. W. Segrist, of Winner, S. D., has sold his blacksmith shop and garage to Edward E. Grau; the latter will continue the business.

The Stutz Motor Car Co. of San Francisco, Cal., is about to open a branch in Oakland; F. W. Hutch will be the manager.

Newton R. Goltra has opened a garage on Railroad avenue, Greenwich, Conn., under the style Depot Garage and Machine Works.

Charles Miller, proprietor of the Jefferson Garage, Bryan, O., has admitted Emmett C. Fuller, of Logansport, Ind., to partnership.

R. Shaffer, Jr., of Hanford, Cal., has purchased a site on Huffman avenue, on which he will build a garage; it will be 118 x 100 feet.

W. Francis Nutt of Newburgh, N. Y., has accepted plans for a two-story garage and storehouse; it will be erected on Overlook place.

The Columbus (O.) authorities have granted permission to Visla S. Horn to build a garage at 73-79 East Spring street; it will cost $3,000.

John W. Taylor and John T. Rogers are the owners of a new garage which has been opened in Eastman, Ga., at College street and Fifth avenue.

F. H. Alford, of New Britain, Conn., will erect a garage at the rear of the Dickinson Building on Main street; it will be a two-story structure, 40 x 52 feet.

Arthur Wilson, formerly connected with the L. D. McCarthy Automobile Co., in Spokane, Wash., has opened a garage at 228 Riverside avenue; it is 50 x 75 feet.

The General Motors Truck Co., of Detroit, Mich., has opened a branch at 1121-23 Locust street, St. Louis, Mo. A four-story building has been leased for a long term.

The Co-operative Motors Co. has been formed in Long Beach, Cal., and will operate a garage; the manufacture of several truck accessories also may be taken up.

A. A. Petit and William Baxter, formerly proprietors of a horse livery, have secured the Cartercar agency for Atlantic, Ia. They will do business as the Atlantic Cartercar Co.

Under the style Foraker-Dayton Motor Truck Co., an agency for the Durable-Dayton has been opened in Chicago at 1700 Wabash avenue; J. B. Foraker is manager.

Edward Menzie, of Mason City, Ia., has purchased a half interest in the Thoe Auto Co., of Belmond, in the same state, and will remove his residence to the latter place.

John Boos of Detroit, Mich., has secured permission to erect a two-story brick garage and hall on Gratiot avenue, between Townsend and Baldwin streets; it will cost $3,000.

The Burkhard-Crippen Co., in Los Angeles, Cal., is retiring from business. Its quarters at Pico street and Grand avenue have been taken over by the Locomobile branch.

Harry H. Vehon of Minneapolis, Minn., is building a one-story brick and tile garage and store building at 2313-2329 Hennepin avenue; it will represent an outlay of $33,000.

Heintz & Seigel, of 3,582 Third avenue, New York City, have been granted a permit to erect a three-story brick garage at Washington avenue and 169th street; it will cost $45,000.

Floyd Richardson, of Lamont, Ia., formerly a half owner of Richardson Bros.' Garage, has purchased the interest of his brother Clyde and will continue the business alone.

R. W. and Paul J. Sander have leased a garage now being built at Cedar and Rose streets, Owatonna, Minn., by M. S. Alexander and E. T. Winship; they expect to open up July 20.

White & Swearingen is the style of an automobile supply firm which has opened up at 10 East Duval street, Jacksonville, Fla. The members are W. S. White and W. S. Swearingen.

Donald MacVichie of Grand Rapids, Mich., has purchased the garage business of the Ludington Auto and Supply Co. A. F. Keseberg, who is the seller in the transaction, retains his automobile agency.

The Broadway and the Ritter garages in Milton, Pa., have been consolidated under the management of T. E. Spangler. The former will be operated as a garage and the latter establishment as a repair shop.

Shirley W. Rawson and Harvey Brown, under the style Brown-Rawson Garage Co., are about to embark in the automobile business in Gardner, Mass. They will occupy what locally is known as the Knowlton factory.

Following a reorganization of the Washington (Pa.) Automobile Co., Harry M. Newman of Pittsburgh, who acquired an interest, has assumed charge of sales; D. H. Swart remains the executive head of the business.

Permission has been granted to August W. Bohn of 112 Park place, Brooklyn, N.

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Y., to erect a two-story brick garage at 125th street, Marks avenue and Vanderbilt avenue; it will be 50 x 131 feet and will cost $18,000.

The Cedar Rapids Sales Co. has opened for business in the Iowa city of that name, at Avenue A and Fourth street. It will handle a general line of accessories, having already secured the state rights for the sale of Sturdy spark plugs.

Charles C. Root, an automobile salesman, has petitioned for the appointment of a receiver for the Freeman Automobile Co., of Indianapolis, Ind. He claims he sold $100,000 worth of cars for the concern, but that the company is insolvent and owes him $1,500.

S. B. Echlin, Reo and Cadillac agent in Janesville, Wis., has sold his business to J. A. Strimple, the Mitchell dealer. Strimple will remove from his old location, 16 North River street, and will combine both businesses in the Echlin garage at 219 East Milwaukee street.

Thomas W. Bunnell, who is engaged in the flour and feed business in Toledo, has entered the automobile trade in that city under the style, Bunnell Auto Sales Co., which is located at 3250 Monroe street. Bunnell has the Northwestern Ohio agency for the Cutting car.

The Schacht Motor Car Co. of Boston has been organized to handle the vehicles of that name in and about Boston, Mass. It comprises F. W. Deming, G. A. Buck and A. R. Taintor, who will incorporate the business and will establish a service station on Commonwealth avenue.

Herman B. Stouder of Newton, Ia., has purchased the interests of his partner, Frank Barngrover, in the Auto Specialty Co. and the Non-Leak Balance Valve Co. and has formed a new partnership with Charles Steele. They will continue the business under the style Keystone Garage.

The Moriarity Motor Co., of Kansas City, which is a recent consolidation of E. P. Moriarity & Co. and the Kaw Valley Auto Co., has taken over the Regal branch in that city and will handle the Regal car in Kansas, Oklahoma and Western Missouri. W. R. Wheeler, the former manager of the Regal branch, has been transferred to duty in California.

Recent Losses by Fire.

Los Angeles, Cal.—Lark Motor Car Co., Jefferson and Main streets, garage destroyed. Loss, $12,000.

New York, N. Y.—Mason-Seaman Transportation Co., 626 West 57th street, taxicab garage and office, damaged. Loss, $500.

Detroit, Mich.—Oakland Motor Sales Co., 806-8 Woodward avenue, garage, salesrooms and several cars damaged. Loss, $8,000.

Philadelphia, Pa. — Gregg-William D. Rogers Co., body manufacturers, 1926-34 Arch street, factory damaged. Loss unknown.

REPAIRER'S RESPONSIBILITY FIXED

Court Holds Him Liable for Damages Done in "Trying Out" Car—Owner Wins Hard-Fought Victory.

If an automobile owner leaves his car at a garage to be repaired and if, after the repairs are completed or are in process, an employe of the garage proprietor takes the car out upon the road for a test and inadvertently attempts to climb a tree with the car, the garage proprietor is liable for damages to the vehicle, according to a supreme court ruling handed down last week in Newark, N. J.

In this particular case one Albert G. Brooker was the complainant, and his story was that he bought a car second-hand and then left it with the F. L. C. Martin Automobile Co., of Plainfield, with instructions that it was to be overhauled "from A to Z." What followed was not greatly disputed by either side, it appearing that a mechanic in the garage while testing the car on the road knocked considerable bark off a tree and practically wrecked the car. The mechanic's story was that the accident was caused by a defective steering gear, and the garage proprietor contended that the order for repairs covered the engine only, so he had not investigated the steering gear and had no means of knowing it was defective. He also claimed the road test was an acknowledged part of the repair work, not requiring the car owner's permission.

A lower court gave Brooker a verdict, and in upholding it the supreme court held that, having taken out the car without instruction from the owner, the defendants did so at their own risk and were liable for the consequences. The court said that the prevalence of such a custom was not established with sufficient certainty to constitute a bar to recovery.

Changes Among Prominent Tradesmen.

L. L. Halle has relinquished his connection with the Lovell-McConnell Mfg. Co., of Newark, N. J., makers of Klaxon horns. For a considerable period he represented the company in the eastern part of the United States.

Benjamin A. Rhoads, superintendent of the Dayton Motor Car Co., Dayton O., has been promoted to the post of factory manager. He succeeds J. B. Myers, who resigned to become general superintendent of the Marion Motor Car Co., of Indianapolis.

C. A. Hills has been appointed factory manager of the Abbott Motor Car Co., of Detroit. He gained ripe experience in the Olds and Chalmers establishments, but for the past several years has served as factory manager for the Hupp Motor Car Co.

George Waite, former sales manager of the Simplex Motor Car Co., of Mishawaka, Ind., has been appointed assistant sales manager of the E. R. Thomas Motor Car Co., of Buffalo, N. Y. He succeeds Edward Wells, who resigned to enter the retail trade.

George H. Duck has been appointed manager of the New York branch of the American Locomotive Co., which carries with it supervision of the Alco service department in Long Island City. Previously Duck was manager of the Matheson Automobile Co., of New York.

R. J. Mackenzie, formerly assistant general manager of the Alden Sampson Mfg. Co., of Detroit, has been appointed purchasing agent for the Kelly Motor Truck Co., of Springfield, O. As he served for several years as purchasing agent for the E. R. Thomas Motor Co., of Buffalo, Mackenzie is no stranger to his duties.

H. D. W. MacKaye has been appointed assistant to the president of the Keeton Motor Co.., of Detroit, and will also have charge of the purchasing department. MacKaye's specialty is systematizing and general detail work. It is stated that he has installed or systematized sales departments in several of the largest automobile factories in this country.

Archie D. MacLachlan, sales manager of the Sanford Motor Truck Co., of Syracuse, N. Y., has resigned that office and will return to his home in Cleveland, O., where for several years he was sales manager of the Royal Tourist Co. MacLachlan probably will relinquish identification with the automobile industry, as it is his desire to so locate himself as to avoid necessity for travelling. His successor in the Sanford company has not yet been named.

Additional evidence that the Michigan Buggy Co., of Kalamazoo, purposes becoming more than ever a factor in the automobile industry, which was indicated when W. H. Cameron, former chief engineer of the Willys-Overland Co., was made head of the Michigan engineering staff, is contained in the appointment last week of George H. Daugherty as advertising manager. Daugherty has had wide experience in the advertising agency field, during recent years having been head of Lord & Thomas's copy department in Chicago.

Declares "Steel Blanks" Not "Castings."

The Board of United States General Appraisers has overruled a protest filed by the St. Louis Car Co. against the Collector's assessment on an importation consisting of articles of metal either in the form of steel blanks to be used in the manufacture of beveled gearing for automobiles, or in the form of finished steel parts for magnetos. Duty was collected on the unfinished metal forms at the rate of 35 per cent. ad valorem under paragraph 127 of the Dingley tariff, as "steel forgings," and on the finished metal parts at the rate of 45 per cent. under paragraph 193, as "manufactures of metal not specially provided for." The metal articles were claimed to be properly dutiable as "castings," under paragraph 148 or 149.

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THE MOTOR WORLD

PUBLISHED EVERY THURSDAY BY

The Motor World Publishing Company
1600 BROADWAY, NEW YORK, N. Y.

A. B. SWETLAND, President and General Manager.
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EDITORIAL DEPARTMENT
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MAXTON R. DAVIES

CHICAGO, 1441 Monadnock Block
J. FRANK GILMORE

Subscription, Per Annum (Postage Paid) $2.00
Single Copies (Postage Paid) . . . . . 10 Cents
Foreign and Canadian Subscriptions $3.00
Invariably in Advance.

Postage Stamps will be accepted in payment for subscriptions. Checks, Drafts and Money Orders should be made payable to The Motor World Publishing Co.

☞Change of advertisements is not guaranteed unless copy therefor is in hand on SATURDAY preceding the date of publication.

Contributions concerning any subject of automobile interest are invited and, if acceptable, will be paid for; or, if unavailable, will be returned provided they are accompanied by return postage.

Cable Address, "MOTORWORLD," NEW YORK.

Entered as second-class matter at the New York Post Office, November, 1900.

NEW YORK, JUNE 27, 1912

APPARATUS THAT ELIMINATES GUESSWORK.

Lack of understanding of the functions and lack of appreciation of the real purpose of scientific instruments commonly has an exaggerating effect in that it tends to surround the apparatus with an air of mystery that acts as a more or less effective bar to better acquaintance. It is in accordance with the dictates of human nature for a man to hesitate to undertake the use of an appliance that, according to his belief, demands the application of knowledge that he does not possess; but it is a fact that in many cases such belief exists without real foundation.

This seems to be the state of affairs that exists with reference to the various appliances that have been devised for making diagrams from the cylinders of gasolene motors. Dynamometers and manographs, for instance, have been, and are, regarded even by many factory men as instruments of such complex construction and requiring such skilled manipulation as to be of value only to the highly educated engineer and scientist for laboratory work. This view of the case is an erroneous one, and undoubtedly is largely responsible for the fact that indicating instruments rarely are used outside of laboratories and factory testing rooms, whereas there is no real reason why they should not be employed in a great many shops where motor repairs and adjustments are made. The extremely practical character of the manograph is indicated by the fact that it will reveal at once, and in an unmistakable manner, faults that otherwise might not even be guessed at. The results of changes in valve setting and other adjustments are made apparent and accurate data on the conditions existing during the working cycle given, not afterward, but while they actually exist. And, finally, the application of the instrument to shop work is in reality a matter of very little difficulty.

While the cost of a good instrument is not unreasonable, even a fairly high price in many cases would be justified by the time saved by its use. Frequently motor faults, apparently baffling, can be detected at once with the aid of an indicator, without even removing the engine from the car, thus saving, perhaps, a tedious and expensive tearing down process. The most refined and scientific methods are employed in the construction of a good motor, and there is no good reason why equally refined methods should not be used in restoring a deranged motor to normal condition, rather than what is called skill or judgment, which but too often really is nothing more nor less than guesswork.

AFFORDING A CLEAR VIEW AHEAD.

Body design and body development have kept pace with the improvement in mechanical structures, but despite the progress, occupants of rear seats of touring cars still are restricted in their outlook, so to speak; their chief view is a rear view of the heads and shoulders of those who occupy the seats in front. Rarely are such views inviting, and few will dare argue that the amount of neck-stretching occasioned by present seating arrangements is wholly desirable or wholly comforting.

Apparently, however, small effort has been made to remedy the state of affairs. Here and there a body has appeared in which the seats have been repositioned but the rearrangement has failed to find favor, or, at any rate, usually has been restricted to a particular brand of cars. The subject, nevertheless, is one that is worthy of serious and more general study. The end to be attained makes it well worth while.

While it scarcely is possible to lower the front seats, a slight elevation of the rear seats and rear flooring is easily possible, and if it can be brought about without giving to the car that outre and high-pitched appearance which characterized the old rear-entrance tonneau it will prove a ready solution of the problem.

On the face of things, and as applied to the average touring car, such an arrangement may be difficult to attain harmoniously, but so far as so-called underslung cars are concerned the elevation of the rear seats and rear flooring affords an immediate and apparently satisfactory answer, and one which there is every reason to believe will add to instead of detract from the appearance of that type of car. It would afford a clear view ahead to the occupants of rear seats, which is a purpose well worth serving and one that scarcely can fail to meet with general appreciation. It, therefore, merits the attention of those most concerned.

The regularity with which the price of gasolene has been advanced since the first of the year strongly suggests the execution of a well arranged program. It will take more than words to convince even a fairly reasonable man that much overworked supply and demand of themselves are responsible for the astonishing increase of 78 per cent. which has been effected in a period of only six months. The situation and the many interests affected suggest that the occasion is opportune for Uncle Sam again to take in hand the probe which he dropped last year on the strength of Standard Oil's promise to "be good."

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RUSH TO S. A. E. WATER SESSION

Big Meeting Aboard Boat is Assured—The Program as Finally Arranged—Evening Clothes Are Tabooed.

First announcements to the effect that members of the Society of Automobile Engineers would not require to make reservations on the City of Detroit II, which is the boat that will carry the party on its second annual convention and permit professional sessions to be held in its spacious saloons during the Friday and Saturday, 27th and 28th insts., later proved to be just a little bit premature.

At first it was said that, owing to the fact that the vessel had been chartered for the trip and that no outsiders would be permitted to cross its gangplank on Thursday, there would be no difficulty in accommodating those who had signified their intention of attending the convention. But in making the statement the S. A. E. had reckoned without its host, so to speak, or without its guests, as the case may be. For, according to present indications, the ship will be loaded to her capacity—her human capacity, at least. No less than 360 members have "signed up" for the trip, and as some 80 of them have signified their intention to take wives or daughters, a subsequent and very urgent notification to the effect that it was absolutely essential for comfort to make reservations in advance became necessary.

The convention will be officially opened on Wednesday morning, 26th inst., in the Convention Hall of the Hotel Pontchartrain, in Detroit, the business in hand being a meeting of the Standards Committee. The principal doings will not be inaugurated until 10 o'clock on Thursday morning, however, when the semi-annual meeting will be opened by President H. F. Donaldson with his presidential address. Immediately following, routine business will be in order and will occupy the time until noon. when a recess for luncheon will be moved. At 1 o'clock atuomobiles will be provided, and the day will be rounded out by visits to some of the larger factories for which Detroit is famous. In the evening the members and the ladies of the party will go aboard the City of Detroit II at the D. & C. dock at the foot of Wayne street. Lines will be cast off promptly at 8 p. m., and the sail to Mackinac Island along one of the most wonderfully scenic routes in the Great Lakes will be commenced.

On Friday morning and afternoon and Saturday morning professional sessions will occupy the time of the S. A. E. members, the following long list of papers and reports being scheduled for discussion:

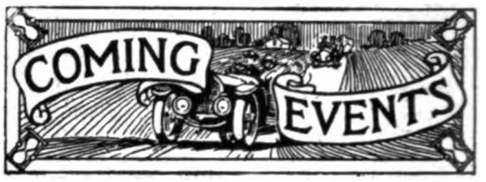
The Standardization Work of the Society of Automobile Engineers, by Henry Souther, Chairman of the Standards Committee; Report of Data Sheet Division, by Cecil P. Poole; Nomenclature Division, by Howard E. Coffin; Cost of Work with Gasolene Motor Trucks, by Louis Ruprecht; Motor Sizes and Drive Ratios for Commercial Vehicles, by E. P. Batzell; Fourth Report of Wheel Dimensions and Fastenings for Tires Division, by Wm. P. Kennedy; Report of Truck Standards Division, by Wm. P. Kennedy; The Effect of Relation of Bore and Stroke in Automobile Engines, by J. Wilkinson; A Comprehensive Motor Test, by Herbert Chase (introduction by Professor F. R. Hutton); Standardization and Co-operation in Motor Testing, by Herbert L. Connell; Third Report of Broaches Division, by C. W. Spicer; Fourth Report of Ball and Roller Bearings Division, by David Ferguson; Third Report of Frame Sections Division, by J. G. Perrin; Worm Gears, by Frank Burgess; Stability of Automobile Propeller Shafts, by J. M. Thomas; Method of Brake Capacity Determination, by S. I. Fekete; Fourth Report of Carburetter Fittings Division, by G. G. Behn; Leaf Springs, by L. J. Lane; Third Report of Springs Division, by Harold L. Pope; Third Report of Miscellaneous Division, (a) Rod and Yoke Ends, (b) General Flange Construction, by A. L. Riker; Third Report of Sheet Metals Division, by T. V. Buckwalter.

In addition to the foregoing list of papers, the following list of subjects has been suggested for discussion, provided time permits; Relative Merits of American and European Carburetters; Electrical Wiring and Gasolene Connections on Motor Cars; Rear Axle Transmission in Motor Cars; Motor Car Acceleration; Gas Engine Inlet and Exhaust Manifolds.

The return to Detroit will be made on Saturday evening, the ship being scheduled to dock at 10 p. m. It is suggested that those of the members who contemplate leaving Detroit on Saturday night make railroad reservations in advance, for the reason that the present time of the year is particularly productive of well-filled trains.

The efforts of the organizing committees to make the summer meeting as much an outing as possible—a sort of picnic where acquaintances can be ripened—is plainly apparent in the preparations which have been made for entertainment on the boat and during the short stay at Mackinac Island. As a further precaution against the serious side obtruding itself too much, it is announced that all gatherings on the steamer will be of a strictly informal nature. Members are warned not to encumber themselves with such evidences of precivilization as evening dress, and it is suggested that a cap, a light raincoat and a pair of rubber-soled shoes will be found very much more useful.

The Minnehaha County Automobile Club has been reorganized at Sioux Falls, S. D. H. T. Brownell is the new president, while A. J. Keith and F. H. Hollister are secretary and treasurer, respectively.



June 27-28, Chicago, Ill.—Interclub reliability run of the Chicago Automobile Club and the Chicago Athletic Association.

June 27-29, Detroit, Mich.—Midsummer meeting of the Society of Automobile Engineers.

June 28-29, Laurel, Md.—Track races promoted by R. E. Shadel.

June 29, Narbeth, Pa.—Track races under the auspices of the Belmont Motor Club.

July 4, Wildwood, N. J.—Straightaway races, under the auspices of the North Wildwood Auto Club.

July 4-5, Butte, Mont.—Track races under the auspices of the Butte Motor Club.

July 4-5, Tayor, Tex.—Track races under the auspices of the Taylor Automobile Club.

July 4-6, Old Orchard, Me.—Beach races under the auspices of the Old Orchard Automobile Association.

July 5-6, Tacoma, Wash.—Road races under the auspices of the Montamara Festo Automobile Commission.

July 7, Fort Wayne, Ind.—Track races promoted by E. A. Moross.

July 13, Forestville, N. Y.—Hill climb under the auspices of the Forestville Motor Club.

July 15-20, Milwaukee, Wis.—Reliability tour, under the auspices of the Wisconsin State Automobile Association.

July 15-16, Cleveland, Ohio—Reliability run under the auspices of the Cleveland News.

July 21, St. Louis, Mo.—Track races under the auspices of the Universal Exposition Co.

July 22, Dallas, Texas—Farm and Ranch Tour under the auspices of the Dallas Automobile Club.

August 8-10, Galveston, Tex.—Beach races under the auspices of the Galveston Automobile Club.

August 23-24, Elgin, Ill.—Chicago Motor Club's national stock chassis road races.

September 2-3, Indianapolis, Ind.—Races on the Motor Speedway, promoted by the Indianapolis Motor Speedway Co.

September 7, Hadine, Minn.—Track races promoted by the Minnesota State Fair Association.

September 17, Milwaukee, Wis.—Grand Prize road race under the auspices of the Milwaukee Automobile Dealers' Association.

September 21, Milwaukee, Wis.—Vanderbilt Cup race on the Greenfield course, under the auspices of the Milwaukee Automobile Dealers' Association.

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BRUCE-BROWN STARTLES FRANCE

With Revived Grand Prix Within His Grasp, a Leaky Fuel Tank Undoes Him —Boillot Takes the Honors.

After permitting it to lie dormant for four years, the Automobile Club of France revived the Grand Prix race on Tuesday and Wednesday last, 25th and 26th inst., and cable reports state that the revival was auspiciously performed in the presence of a huge crowd that lined the Deippe circuit. Despite the fact, the French race, which went for 956 miles, now lacks the world-interest it once possessed.

In America the chief interest in the revived classic, which was run in two sections, centered in the performance of David Bruce-Brown and Ralph De Palma, who, although they piloted Fiat cars of Italian manufacture, are Americans to the manor born. The one American car which was to have competed, a Ford, driven by a Frenchman, H. De Passe, did not start.

Although both American drivers finally were disqualified for technicalities, it was Bruce-Brown who set the pace throughout three-quarters of the distance, and had not his fuel given out at an inopportune time it is not at all unlikely the first honors would have been his portion.

Throughout the first day's flight of 478 miles, Bruce-Brown gave his foreign competitors a run for their money. After assuming the lead in the very first round of the 47.8-mile circuit, he never was passed, and finished the ten laps which completed the first day's program in 6:36:38, at an average rate of 72.4 miles an hour. George Boillot, who piolted a Peugeot, took second position, crossing the tape a little over two minutes later. Louis Wagner, who also drive a Fiat machine, ended the first day in third position, his time for the distance being 7:12. The American driver made the record for a single circuit for the first day when he rounded the course in 37:18⅕, at nearly 76.8 miles an hour.

But one accident of a serious nature marred the sport of the first day; it proved fatal to Bessagnana, a mechanician on the Gregoire car, which was piloted by Collinet and which came to grief in the second lap. Collinet attempted to pass Garcet in a Calthorpe on one of the turns, but misjudged his distance and the French and English machines locked wheels. The Gregoire car turned completely over and both driver and mechanician were pinned beneath it, the former being seriously injured and the latter instantly killed.

For the first three laps on the second day Bruce-Brown continued the role of pacemaker, with Boillet and Wagner following in the order named. Unfortunately, however, his fuel tank sprung a leak, and the waning supply of gasolene caused motor trouble which cost Bruce-Brown his position before the fourth lap had been completed. When half way around the circuit on the fifth lap, fuel failed him completely, which necessitated a stop.

All would have been well, had the machine stopped at no great distance from the pits, but such was not the case. Unable to push the heavy car to the pits, he replenished the fuel supply at a neighboring roadhouse and was, as a consequence, disqualified. He received the red flag, which told him he was out of the running, when he passed the judges' stand for the fifth time, but only stopped long enough to enter a formal protest. He finished the race, unofficially in third position, Boillet having profited by the delays of the former pacemaker and finished in 7:34 20, his total time for the two days being 14:11. Wagner, too, drove his Fiat car across the tape ahead of Bruce-Brown and finished three minutes later than the winner. Rigal, driving a British built Sunbeam car in the light car class, officially finished third, his time being 14:38:36.

De Palma also was disqualified for filling up his fuel tank at a place remote from the pits, but as he was at no time a dangerous factor in the race, his misfortune affected him little, if at all.

Indianapolis Abandons Labor Day Meet.

Because of failure to obtain assurances of a sufficient number of really attractive entrants to make the holding of a fall meet worth while, the management of the Indianapolis Speedway has abandoned its plan for a two days' meet to be run Saturday, August 31st, and Labor Day, Monday, September 2nd, for which sanction already had been granted by the Contest Board of the A. A. A. It is now proposed that another day be added to the May program, which then will comprise the single 500-mile sweepstakes event and a series of short contests in which the contenders will compete for such prizes and trophies as the Remy Brassard and trophy and the Wheeler-Schebler trophy, and, of course, for the parcels of cash which are more attractive than trophies to the general run of professional drivers.

Whether or no the abandonment of the Labor Day card at Indianapolis will in any way affect the dates on which the Vanderbilt and Grand Prize races are scheduled to be run is a matter of conjecture, but in view of the fact that considerable but unavailing persuasion was offered by the managers of the Milwaukee races in an endeavor to have the Speedway card dates changed, it seems not at all unlikely that a shift in the Milwaukee schedule may come to pass.

Club Organized in Devil's Lake.

The Devil's Lake Automobile Club has been formed in the North Dakota town of that name with these officers: President, Dr. G. J. McIntosh; vice-president, George W. Moore; secretary, Thomas Turner; treasurer, George Chaffee.

KULICK HONOR MAN AT ALGONQUIN

Proves "Whole Thing" on the Twin Hills— Rain Interrupts but Benefits Diminished Glory of Event.

For the seventh time the twin hills at Algonquin, Ill., supplied the setting for the annual hill climbing contest of the Chicago Motor Club which, owing to the untimely intervention of Jupiter Pluvius, was not completely decided until Friday last, 21st inst., although the major portion of the program was run on the day previous, according to schedule. Frank Kulick, who drove a specially built Ford, which was almost as light as a figurative feather, although powered with a motor with a piston displacement of 410 cubic inches, not only annexed the Algonquin cup, which has been the property of "Eddie" Hearne since the hill climb of 1911, but also lowered the records made by that Benz driver both for the combined time made on the two hills, and for the separate performances. Kulick's time for the Algonquin hill, which is the shorter, albeit steeper, of the pair, was 15⅗ seconds, which is 1⅕ seconds better than the time made by Hearne; the Ford driver mounted Phillips hill in 27⅕ seconds, which is 3⅗ seconds better than the time of the former cup holder.

Kulick, who made such a good showing in the event last year when he was the runner-up to Hearne, had things his own way in every event in which he contested save one. He won the Class C, 301-450 inches, the Class E, under 600 inches, and the free-for-all events, his time for each event in the order named being 43⅘ ,42⅗ and 44⅕ seconds; he lost the Class C, 161-230 inches event by only two-fifths of a second. Dusenberg in a Mason took second place both in the Class E and the free-for-all event, his time being 48 seconds in each case. C. Anderson ran his Stutz into second place in the Class C, 301-450 inches event, but he was 8⅕ seconds behind Kulick.

Not alone were the entries fewer than last year, which in itself would tend to detract from the contest, but the program which last year comprised 18 separate events was shortened to seven, and of these but one was for stock cars. Also the many professional stors who last year completed in the Indianapolis Speedway event and who then journeyed to Algonquin, were absent. But two of the contenders, Joseph Nikrent and Kulick, were known to fame. In shortening the program the class wherein the cars are graded according to selling price was cut to one event, and this single stock car event was run with but a single entrant, A. Monsen, who piloted a Bergdoll car up both inclines in a total of 90⅘ seconds. In the Class C, under 160 inches displacement event, W. G. Wordingham, who drove a Herreshoff, his total time being

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1:26⅗, also ran " by his lonesome" and won a hollow victory.

The Class C, 161-230 inches event was hotly contested by G. Shillo in a Mercer and Dusenberg in a Mason, both of whom mounted the hills in a total of 49 seconds, with Kulick but ⅗ of a second behind them. Joe Nikrent, who drove a Case car, captured first place in the 231-300 inches class, his total time being 50⅗ seconds.

The downpour of rain which interrupted the proceedings on Thursday before the contenders in the Class E, under 600 inches displacement event, and the free-for-all had had time to climb the longer gradient, although for the time being it converted the erstwhile race course into a veritable river, really improved the condition of the road, so that the events run on Friday were contested under ideal conditions.

The very original mode of procedure which always has been carried in the running of the Algonquin hill climb was again adhered to, and each of the events was run on the Algonquin hill on Thursday morning and rerun on the longer hill on Thursday afternoon or Friday morning. The times made on both hills were added together, as usual, to give the total time. The summary:

Class A, Division 3A, $1,201-$1,600.

Driver and Car.	Algonquin.	Phillips.	Total.
A. Monson, Bergdoll	0:43	0:47⅘	1:30⅘

Class C, Division 1C, under 160 inches.

W. G. Wordingham, Herreshoff	0:38⅘	0:47⅘	1:26⅗

Class C. Division 2C, 161-230 inches.

A. G. Schillo, Mercer	0:18	0:31	0:49
Dusenberg, Mason	0:18	0:31	0:49
F. Kulick, Ford	0:17⅗	0:31⅘	0:49⅗

Class C. Division 3C, 231-300 inches.

Joe Nikrent, Case	0:20	0:30⅗	0:50⅗
H. W. Ogren, Colby	0:25⅘	0:40⅘	1:06⅗

Class C. Division 4C, 301-450 inches.

F. Kulick, Ford	0:15⅗	0:28⅕	0:43⅘
C. Anderson, Stutz	0:21	0:32	0:53
M. Moore, Stutz	0:21⅘	0:32	0:53⅘

Class E, under 600 inches.

F. Kulick, Ford	0:15⅗	0:27⅕	0:42⅗
Dusenberg, Mason	0:18⅕	0:29⅘	0:48
Joe Nikrent, Case	0:18⅕	0:30⅕	0:48⅗
H. W. Ogren, Colby	0:24⅗	0:41⅗	1:06

Class D, Free-for-all.

F. Kulick, Ford	0:15⅘	0:28⅗	0:44⅕
Dusenberg, Mason	0:18	0:30	0:48
A. G. Schillo, Mercer	0:18⅗	0:31	0:49⅗
C. Anderson, Stutz	0:22⅕	0:35⅕	0:57⅗
H. W. Ogren, Colby	0:28⅘	(Did not finish)	

Seek "Automobile" Street in 'Frisco.

Because of the congestion of traffic in Sutter street, San Francisco, practically now the only available thoroughfare for automobile traffic between the city and the Western Addition, the automobile associations of that city have asked the municipal authorities to repair Post street and set it aside as an exclusive auomobile thoroughfare, at least during rush hours. Post street has but a short stretch of street car tracks, and with the addition of a few blocks of new pavement would make a good driveway for the automobiles. Many business men who live in the Western Addition would appreciate some means of reaching their places of business without the delay and danger incident to the congestion of mixed traffic which at present prevails.

MENENGHETTI GETS "MEAL TICKET"

Italian "Unknown" Finally Takes Remy Brassard from Burman at Akron Meet—Four Events Constitute Program.

If Louis Menenghetti, the Italian "unknown," had not wrested the Remy Brassard or $50 per week "meal ticket" from Robert Burman, there would be little to say of the four-event racemeet which, promoted by E. A. Moross, was run on the Fountain Park track at Akron, Ohio, on Saturday last, 22d inst. Just how Burman came to relax his grip on the "meal ticket" which he had held so firmly in his grasp since May of last year is not quite clear, but it happened, nevertheless. The race was run in three heats of three miles each, and although the Italian won the first two, the third heat also was run apparently to give the crowd its money's worth. Menenghetti won it also, his times being 4:47⅕, 3:44⅗ and 3:09, respectively.

A two-mile Class C event, for cars in the 161-250 inches division, was won by W. L. Stauffer in a Flanders, in 3:23, an exhibition mile driven by Burman in the Blitzen Benz in 1:14⅕, and a five mile free-for-all which was taken by John Raimey, who drove an Ohio car, in 8:15 completed the program. The summary:

Two miles, for cars of 161-250 inches displacement—Won by W. L. Stauffer (Flanders); second, James Jones (Hupmobile). Time, 3:23⅕.

Three miles, free-for-all. First heat for Remy Brassard and trophy—Won by Louis Menenghetti (Mercedes); second, Robert Burman (Ohio); third, E. A. McDonald (Benz). Time, 4:47⅕. Second heat—Won by Louis Menenghetti (Mercedes); second, Robert Burman (Ohio); third, E. A. McDonald (Benz). Time, 3:44⅗. Final heat—Won by Louis Menenghetti (Mercedes); second, Robert Burman (Ohio); third, E. A. McDonald (Benz). Time, 3:09.

One mile, time trial—Robert Burman (Benz). Time, 1:14⅕ from a flying start.

Five miles, free-for-all—Won by John Raimey (Ohio); second, W. L. Stauffer (Flanders). Time, 8:15.

Itinerary of Four States Tour Revised.

Evidently the addition of a second "day of rest," so that none of the entrants in the Four States Tour will become unduly fatigued, was considered advisable by the Board of Directors of the Indiana Automobile Manufacturers' Association, for the itinerary has so been altered that on July 21st, instead of journeying from Huntington, W. Va., to Maysville, Ky., as was announced in the itinerary as originally drawn, the tourists will rest in Huntington. Other slight changes have been made in the route, 1,283 miles in extent, which will be covered between July 9th and the 24th, as well as in the time schedule. On July 18th, instead of resting at Washington Court House, Ohio, the cavalcade will stop at Chillicothe and will not reach Washington Court House until noon of the following day. This and the addition of July 21 to supplement the 13th as a day of no travel, however, are the chief changes.

The itinerary in revised form is as follows: July 9, Indianapolis, Kokomo, Peru (noon), Wabash, Huntington and Fort Wayne. July 11, Lima, Findlay, Fostoria, Fremont (noon) and Tiffin. July 11th, Tiffin, Bucyrus, Mansfield (noon), Ashland, Barberton and Akron. July 13th, tourists rest at Akron. July 14th, Akron to Canton. July 15th, Canton, Massillon, Canal Dover, New Philadelphia, Cadiz (noon), and Wheeling, W. Va. July 16th, Wheeling, Cambridge, O. (noon), New Concord and Zanesville. July 17th, Zanesville, Newark and Columbus. July 18th, Columbus, Lancaster, Circleville and Chillicothe. July 19th, Chillicothe, Waverley and Portsmouth. July 20th, Portsmouth, Ironton, Coal Grove, Ashland, Ky., Charlottesburg, Kenova, W. Va., and Huntington, W. Va. July 21st, tourists rest at Huntington. July 22nd, tourists take boat to Maysville, Ky., from Huntington at 3 A. M., Maysville (noon), Paris and Lexington. July 23rd, Lexington, Frankfort, Shelbyville and Louisville. July 24th, Louisville, New Albany, Scottsburg, Seymour, Columbus (noon), Franklin and Indianapolis.

Four Clean Scores in Pine Tree Contest.

Of the nine contenders who started in the Pine Tree Reliability Tour, which started from Portland, Me., on Thursday last, June 20, under the auspices of the Pine Tree Motor Contest Association, and covered a more or less tortuous circuit, 350 odd miles in extent, which led from Maine into New Hampshire and back again, but four finished with a clean slate. They were L. C. Gilson, who drove a Mitchell; J. L. Judd, who piloted one of the two Jackson cars which were entered; E. W. Blanchard, in a Stoddard-Dayton, and N. E. Haskell, who piloted a Stearns-Knight.

Penalties began to pile up on the very first day of the three-day run, and before the 80 miles to Gorham, N. H., the night stop, had been covered, the R. C. H. car, which was guided by Fred Morse, had annexed 31 points, all occasioned by the occasional overheating of the motor, owing to the waste of water caused by a leaky radiator, while the Oakland entry which L. A. Stoughton drove and which had skidded into a ditch with a demolished wheel as a result, was penalized 280 points. On the 166 mile run to Bangor two contenders, O. S. Morris in a Jackson and George Merrow, who drove the American, were penalized 11 points each. On the third day's run, 110 miles, from Bangor to the starting point, Merrow's American received 82 points, and the Ford car, which was driven by A. M. Spear, received two points, all through troubles having their origin in the motor.

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TRUCKS PARADE IN QUAKER CITY

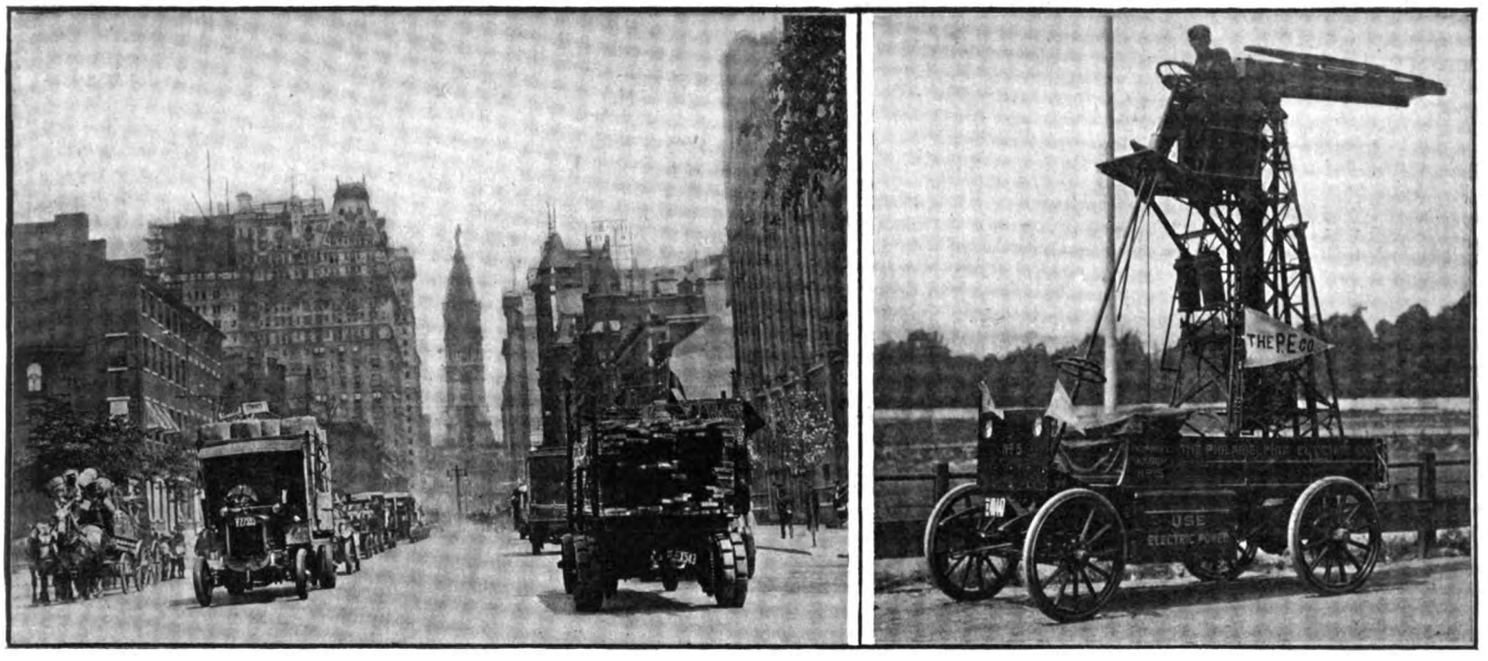
Half-Thousand Vehicles, in Five Divisions, Arranged in Uncommon but Logical Order—Some Picturesque Types.

There are motor truck parades and motor truck parades, and each is conducted with the avowed purpose of letting the prospective purchaser get a glimpse of the type of vehicle in which he is most interested while "in action"—that is, while operating under service conditions. According to the usual order of things, the line-up of the vehicles is made with scant regard either as to size, purpose or type of the vehicles, and trucks of the heaviest type are oftentimes preceded or followed, as the case may be, by the lightest type of delivery wagon, and the electric vehicles are mixed indiscriminately with the gasolene propelled machines.

It was different with the parade promoted by the Philadelphia Enquirer, which on Thursday last, 20th inst., wound its way slowly through all of the principal business streets of Philadelphia and proceeded finally up Belmont avenue as far as Belmont Park, where a great number were parked throughout the afternoon, in order to afford opportunity for closer inspection. The vehicles were divided into five groups, and each group was distinguishable by pennants and decorations of a different color from the rest. The first four groups embraced gasolene machines exclusively. In the first section, wherein the vehicles were decorated with red flags, no vehicle of a carrying capacity of less than 3½ tons was permitted; in the second section the carrying capacities were between 2 and 3½ tons and the trucks carried blue markers. The third and fourth divisions, which were recognizable by the orange and green pennants, respectively, embraced trucks with capacities up to one ton. The last division was for electric vehicles exclusively, and all sizes of vehicles were grouped. A marshall supervised the arrangement of the vehicles in each division and each section was preceded by a band wagon.

Variety naturally was to be expected with so large a caravan, which embraced some 509 vehicles of 71 different makes, and each of the five divisions yielded besides a great number of vehicles of orthodox design, several which, owing to unusual construction or adaptation, created more than an ordinary amount of interest. Quite a little attention was stirred up by the appearance in the first division of the Alco truck which is to cross from coast to coast laden with soap, while a Saurer truck, which carried a horse as a passenger and bore signs with the single word "Emancipation" interested not a few of the observers who lined the sidewalks three deep.

The "features" of the second division were diverse, and included besides the large service truck of the Bell Telephone Co., which was exhibited with a complete complement of pole setting appurtenances, including a reel of lead-covered cable which was towed behind, a combination hearse and funeral carriage designed to carry not only the casket but the mourners up to two dozen in number, as well, and which was entered by the Lawncroft Cemetery Association. In contradistinction to the Saurer machine which carried the horse in the first division, a White 2-ton truck bore a finished chassis of a White pleasure car. The third division, which might be termed the "Autocar" division, because of the number of cars of that make which were entered in it, included the Autocar truck which recently underwent the army test and which was decorated with numerous photographs depicting incidents which occurred during the tests, several picturesque "water wagons" and a police patrol with full complement of bluecoats, which was entered by the General Motors Co. The operation of these "water wagons," which is conducted by the Women's Pennsylvania S. P. C. A., is purely a Philadelphia institution. The trucks, which are painted white and are provided with a large tank for carrying water, which is used to allay the thirst of the equine species, and a water cooler in which ice water is provided to fill the needs of the drivers, were presented to the society as memorials by the friends and relatives of members who have joined the silent majority.



THE PARADE ON MARKET STREET AND ONE OF THE PICTURESQUE VEHICLES IN LINE

The fourth division, which was composed of delivery vehicles, was, as naturally was to be expected, by far the longest division of the five.

The electric division included everything from a light delivery runabout to the 3-ton trucks which were entered by the Philadelphia Electric Co. Especial interest attaches to the factory truck which was exhibited by the Woods Electric Garage and which, although propelled by a motor of only 2 horsepower capacity, through the intermediary of road wheels less than a foot in diameter, and guided by a "chauffeur" who stood on the rear platform and steered by means of a tiller, made the complete trip to the park and back without mishap. The "dog catchers' wagon" of the S. P. C. A. also was in evidence in the electric division.

Music in plenty was supplied for the entertainment of the vehicle drivers and the occupants of the trucks as well as the observers, and the music was well distributed so that all might share in the enjoyment;

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large trucks were pressed into service as band wagons and one preceded each section of the parade, and, lest those who brought up the rear of the electric division grow weary, a sixth band made music at that point.

The following is a list of the separate makes of cars in the parade, listed according to their numerical strength: Autocar, 79; Packard, 47; Mack, 38; Commercial, 29; White, 29; G. M. C., 21; Gramm, 19; Ford, 18; Garford, 17; Alco, 16; Wilcox, 16; Hart Kraft, 10; Cartercar, 9; Kelly, 9; General Vehicle, 8; Chase, 7; Durable Dayton, 7; Peerless, 7; Studebaker, 7; Detroit Electric, 6; Kissel Kar, 6; Little Giant, 6; Service, 6; Buick, 5; Pierce-Arrow, 5; Saurer, 5; Columbus Electric, 4; Dart, 4; Decatur, 4; Atterbury, 3; Cadillac, 3; Courtland, 3; Mais, 3; Mitchell, 3; Walker, 3; Waverley, 3; Woolston, 3; Croxton, 2; Grabowsky, 2; Hatfield, 2; Kendle, 2; Martin, 2; Rowe, 2; Stanley Steamer, 1; Automatic, Baker Bell, Baker Electric, B. O. E., Commer, Dennison, Franklin, Flanders, Hupp Yeats, Knox, Lansden, Lincoln, Maxim Tricar, Maxwell, Metz, Morgan, Otto, Philadelphia Electric, Pope Hartford, Premier, Sampson, Sandusky, Seitz, Sharon, Stoddard-Dayton, Thomas, Warren, 1 each.



PHILADELPHIA "WATER-WAGON"

Truck Club to Offer Police Medal.

Emulating the example of the Automobile Club of America, and as an evidence of its appreciation of the work of the traffic police, the New York Motor Truck Club has voted to present annually a gold medal to the policeman who, in the course of a year, proves himself to be most efficient as a handler of traffic. The club has appointed a committee to draft the conditions of award and other details, but thus far little has been decided except that the presentation will be made at the annual police inspection.

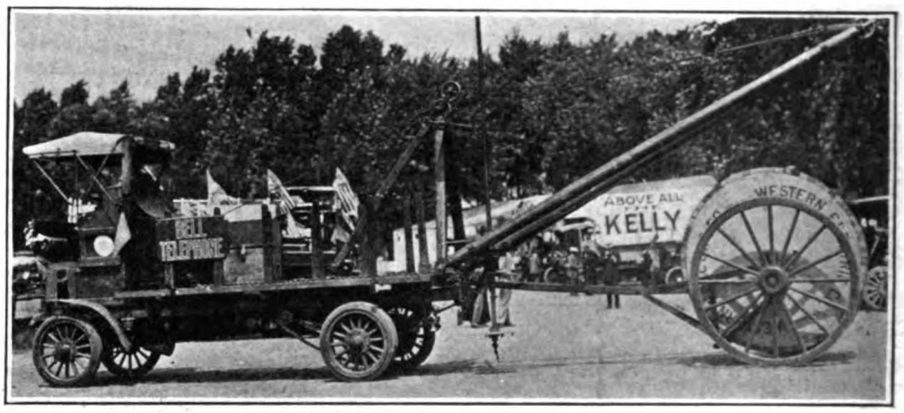
Rockford Club Chooses New Officers.

Dr. A. B. Atchison was elected president of the Rockford (Ill.) Automobile Club at the annual meeting. The other offices were filled as follows: Vice-president, C. R. Osborn; secretary, Frank M. Bertrand; treasurer, E. A. Anderson. The executive committee comprises: A. T. Roberts, Dell McPherson, W. W. Sawyer, Fred K. Carrico, E. L. Thayer.

MOROSS'S MEN VISIT YOUNGSTOWN

Menenghetti "Repeats" in Brassard Race and Raimey Bags a Block of Four—Unprofitable Day for Burman.

Probably the most interesting of the eight events which were run on Sunday last, 23d inst., by E. A. Moross and his stable of stars and near-stars for the benefit of the Youngstown (Ohio) public, were the three three-mile free-for-all events which were run as heats for the Remy Brassard and trophy, two of which were won by Louis Menenghetti, the Italian "Unknown" who piloted a Mercedes car first across the tape in both the first and in the final heats, and who first got a grip on the "meal ticket" the day before at Akron. Menenghetti's time was 3:31 and 3:36, respectively, while the best Burman, who in a Benz won the second heat, could do was 3:44.



ANOTHER PICTURESQUE EXHIBIT—A POLE-ERECTING VEHICLE

Burman landed in second place in the first heat, in which he drove the Cutting machine, and in the last heat, in which he drove the Benz, while the other contestant, E. A. McDonald, who piloted the Benz in the first and the Cutting in the second and third, came third in each of the three events. McDonald and Burman changed mounts after the first heat. Had either Burman or McDonald won the majority of the events, they must have waived any claims for either money or trophy, for according to the deed of gift under which the Remy Brassard is competed for, it cannot change hands more than once every ten days; and Menenghetti had won the trophy only the day before.

John Raimey, who drove an Ohio, also was a star performer. He won each of the four events in which he entered, including two Class E, free-for-alls, one for five and the other for 25 miles, which he completed in 5:30 and 34:16½, respectively, a Class C, 301-450 inches event, which went for five miles and which he completed in 5:53, and the final event of the day, a five-mile free-for-all handicap, in which he started from scratch against three other contenders, each of whom had a time allowance and finished in 5:24½. Burman drove a single exhibition mile in the Blitzen Benz in 1:08½. The light car event, five miles for cars in the 161-250 inches displacement class, went to a local driver, C. Lucas, who covered the distance in 5:46 in a Firestone-Columbus. The summary:

Five miles, for cars of 161-250 inches displacement—Won by C. Lucas (Firestone-Columbus); second, W. L. Stauffer (Flanders); third, G. Faulkinson (Ford). Time, 5:46.

Five miles, for cars of 301-450 inches displacement—Won by John Raimey (Ohio); second, Albert Elton (Cadillac); third, George Seidner (Warren). Time, 5:53.

Five miles, Class E, for cars under 600 inches displacement—Won by John Raimey (Ohio); second, Robert Burman (Cutting); third, Albert Elting (Cadillac); fourth, George Seidner (Warren). Time, 5:30.

Three miles, free-for-all, for Remy Brassard and trophy—First heat—Won by Louis Menenghetti (Mercedes); second, Robert Burman (Cutting); third, E. A. McDonald (Benz). Time, 3:31. Second heat—Won by Robert Burman (Benz); second, Louis Menenghettti (Mercedes); third, E. A. McDonald (Cutting). Time, 3:44. Final heat—Won by Louis Menenghetti (Mercedes); second, Robert Burman (Benz); third, E. A. McDonald (Cutting). Time, 3:36.

One mile, time trial—Robert Burman (Benz). Time, 1:08½ from a flying start.

Twenty-five miles, Class E, for cars under 600 inches displacement—Won by John Raimey (Ohio); second, Albert Elton (Cadillac); third, W. L. Stauffer (Flanders). Time, 34:16½.

Five miles, free-for-all handicap—Won by John Raimey (Ohio) from scratch; second, Albert Elton (Cadillac), 35 seconds handicap; third, George Seidner (Warren), 40 seconds handicap. Time, 5:24½.

Bowen Heads Owensboro Club.

At the annual election of the Owensboro (Ky.) Automobile Club, R. W. Bowen was chosen as president. The other officers of the organization are: Vice-president, Dr. O. W. Walsh; secretary, H. L. Scharlich; treasurer, W. L. Reno.

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NEW R. C. H. "BEST" NOT "BETTER"

Makers Explain Application of Adjectives to Latest Product—Equipment Changes Principal Alterations in Line.

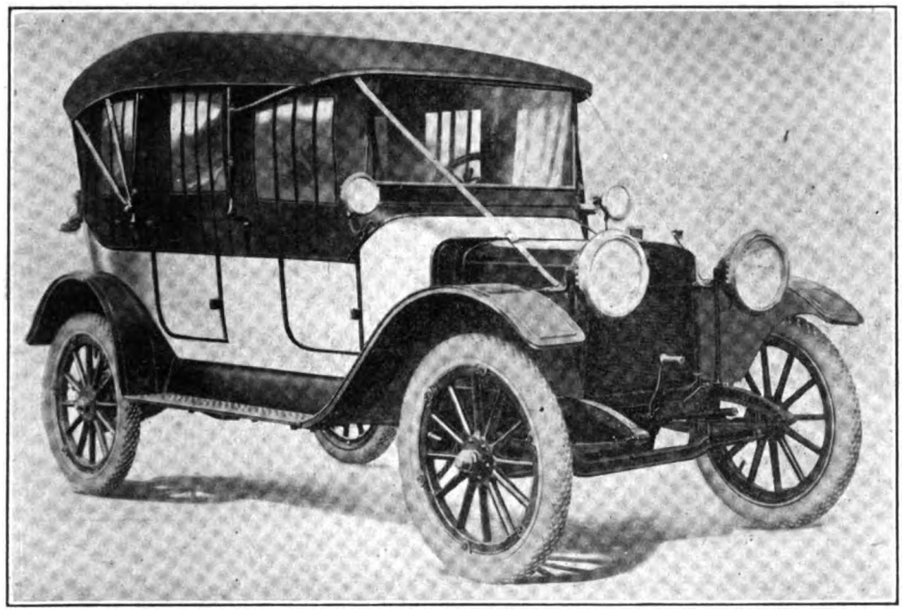
By way of carefully eradicating any possible misconception that might have been engendered by the R. C. H. Corporation's somewhat unusual statement to the effect that the latest edition R. C. H. car, which just has made its appearance, "is not a better car," it is explained almost in the same breath that it is impossible to apply the comparative degree of the adjective good to a product that from the first has been apostrophized by the superlative degree of the same adjective. Which is to say, there has been found no room for improvement, and the revised R. C. H. car, which, in view of the factory policy of the manufacturer, quite naturally follows the model that early last Fall made its initial appearance, is really so little revised in the usual sense of the word as to be practically unchanged.

Such changes as have been made concern neither the design nor the construction of individual parts, but are rather in the form of additions to equipment, which makes plain the fact that though there may not have been the possibility actually to better the mechanical construction of the car, the manufacturer has not hesitated to better the value of the investment represented by the purchase price. Practically the only change in construction which has been made embraces the addition of hand emergency brake lever, which takes the place of the ratchet pedal heretofore employed. Additions to the equipment which in a measure account for an increase of $50 in the price of the five-passenger touring car, which now lists at $900, include electric lights throughout, demountable rims with an extra rim and holders, Warner speedometer, "Jiffy" side curtains, rear view mirror and a "Tally-ho" horn. Standard equipment which last year was featured is included as a matter of course and embraces a top with boot, folding windshield, jack, tire pump and repair kit and the usual complement of tools and spare parts.

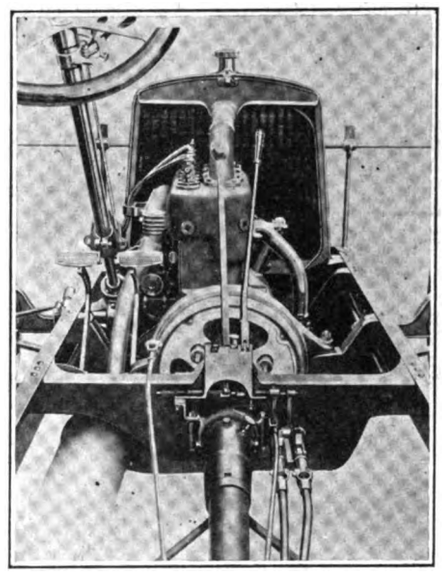
Bespeaking the maximum of simplicity tempered with accessibility, the motor remains without change, the four cylinders being cast in a single block with the intake, exhaust and water passages cored in. The distinctive construction with the magneto and the carburetter totally divorced on opposite sides of the engine, a practice which at the time of its adoption was explained as eliminating the possibility of fires resulting from stray sparks igniting gasolene fumes, while at the same time permitting the gas to be heated prior to its inspiration, is retained. The carburetter is of the float-feed single jet type and has but two points of adjustment. The cylinders measure 3¼ inches bore and 5 inches stroke, and under the Royal Automobile Club of Great Britain formula, which, it is explained, has been used in preference to the S. A. E. formula in obtaining the nominal rating, for the reason that the latter formula does not take into consideration power increase due to lengthened stroke, the indicated horsepower is 25. Under bench tests, however, 27 horsepower has been realized at 1,700 revolutions a minute.

As heretofore, lubrication is effected entirely by splash, experience having proven that under normal running conditions the amount of oil fed up hill and down dale varies as the speed of the engine and maintains all internal moving parts at the proper degree of slipperiness without causing smoke or an excessive oil bill. Thermo-siphonic action is depended upon to circulate the water in the cooling system, the usual radiator and jacket reservoirs being supplemented by extra compartment in the top of the radiator, which operates to maintain the water at an even temperature at all times. The engine is sparked by a Bosch high tension magneto with fixed ignition point, there being but four high tension and two low tension wires in the entire ignition system, which, together with the elimination of the water circulating pump with its rotating shaft and pipes still further increases the simplicity of the power plant.

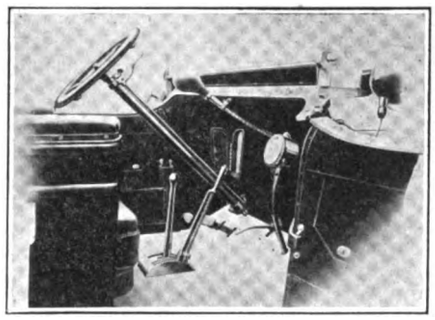
By the addition of the hand lever, which operates the emergency brakes, a slight rearrangement of the clutch control and gear shift mechanism has been made necessary, though it is not such as to add complication, as may be seen by the accompanying picture. The right pedal now controls only the service brake, the duties of the left pedal being restricted to the operation of the clutch, which is of the leather faced cone variety. The distinctive method of applying the clutch leather without the use of cement or rivets is retained, which feature, it is pointed out, makes it a simple matter for other than skilled hands to apply new facing in case of failure of the old through continued use. Both sets of brakes



R. C. H. TOURING CAR, EQUIPPED WITH JIFFY CURTAINS



CENTER CONTROL AND LEFT STEER

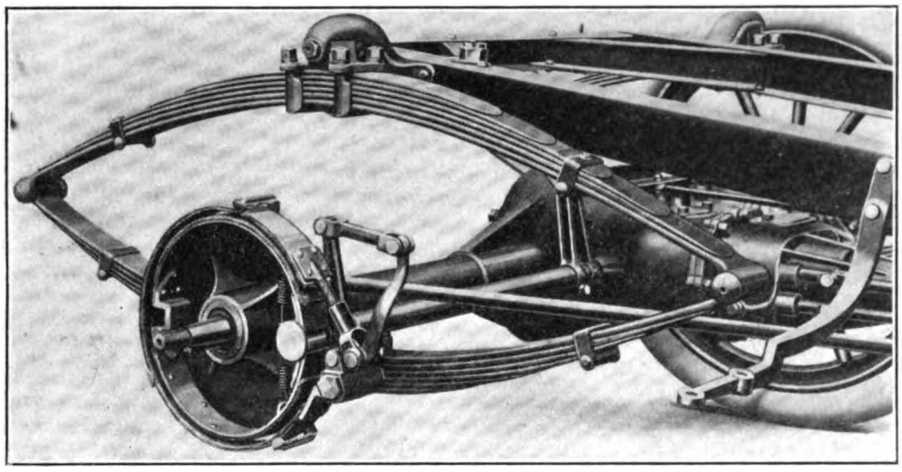


BEHIND THE R. C. H. DASH

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are located on rear wheel drums and are equipped with equalizers. The change gear mechanism occupies its former place on the rear axle, the casing forming a unit with differential housing, thus stiffening the construction and reducing the liability of road strains and weaving causing the shafts to be thrown out of alignment. Three speeds forward and reverse are provided, the control being selective by means of an H quadrant.

As was the case with the older models, the wheelbase of the new R. C. H. is 110 inches, the front of the car being supported on wide semi-elliptic springs and the rear of the car being carried on full elliptic members. The rear springs are "uptilted" at the front to permit the maximum degree of flexibility and compressibility and their efficient action under all road conditions is further insured by their swivel seat mountings. Tires are of the same size all around,



R. C. H. BRAKE GEAR AND SWIVELED REAR SPRINGS

32 x 3½ inches—and are of rubber tread non-skid variety. As already has been mentioned, demountable rims are regular equipment.

The British type of body, the distinguishing feature of which is its high flush sides, its "built-in" windshield and its deep skuttle dash, has been retained as a matter of course, though pains have not been spared to modify its lines wherever necessary in order to increase the comfort of passengers. The rear seat is unusually wide and measures 43½ inches, thus providing ample room for three passengers, and the front seat measures 38½ inches in width by 18 inches in depth. All bodies are finished in the exclusive R. C. H. color scheme —which is to say, the hood, fenders and running gear are black, set off by solid, dark red coloring in the body proper, and enlightened by a broad band of black around the top. Included in the electric light equipment, which takes the place of the oil and acetylene lamps and generator, are two 12-inch parabolic reflector head lamps, of the "bullet" type, two similarly shaped side lamps, a tail lamp and a 100-ampere-hour Exide storage battery.

BIGGER CADILLAC IS IN PROSPECT

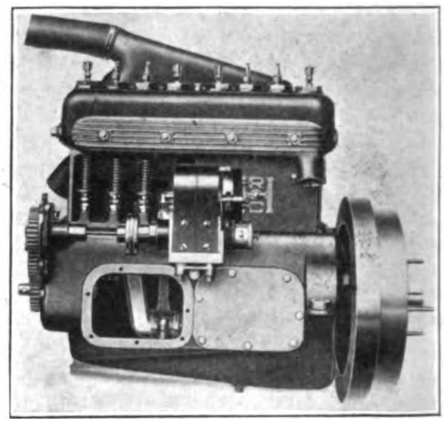
Famous Car to Take Place in Powerful Class—Long Stroke Engine and New Suspension Adopted.

For the season of 1913, the line produced and marketed by the Cadillac Motor Car Co., Detroit, Mich., will be distinguished by an entirely new motor of the long-stroke type, which is very much larger than any that has borne the Cadillac nameplate in the past. The new motor will rate 50-60 horsepower, and among a number of other new features which will mark it as distinct from previous Cadillac products it will be equipped with an automatic governor, which is calculated properly to proportion the quantity of "mixture" admitted to the cylinders under normal and abnormal running conditions, thus affording the motorist automatic solution of a problem which has very often proven difficult for drivers of cars.

The newness of the power plant is carried even to the method of mounting, which is a radical departure from anything else of its kind. Though the plan hinges on the idea involved in three point support, it is said the arrangement of the supporting bearings is such as to reduce vibration and the possibility of damage through frame weaving to a greater extent than ever has been possible before. Briefly, the third point of support, which is at the front of the engine, is arranged near the top of the cylinders instead of near the crankshaft, as usually is the case.

Corresponding to the increase in the size of the motor, the car also will be more liberal in every sense of the meaning, the body being larger and more luxurious and the wheelbase being increased five inches. Electric lights will be included, as a matter of course, the Delco lighting and engine starting system in a revised and more compact form being retained. Though the list price of the car has been increased to $1,975, it is explained that by reason of the extra equipment which is added and the better all around value that is represented, the price actually is lower than last year was asked for the smaller model.

Though the Cadillac company, in common with a number of other equally well known companies, has for some time been experimenting with a six-cylinder model, attention will be confined for the present to the production of the new four-cylinder model, deliveries of which it is expected will be commenced about August 1.



R. C. H. BLOCK MOTOR

Knight Seeks to Solve Fuel Problem.

Charles Y. Knight, the inventor of the sleeve-valve motor which bears his name, is unusually fortunate in his ability to keep in the limelight and to make easy the work of his publicity bureau. According to the latter, Knight, born in America but now residing in Warwickshire, England, is making ready to undo Standard Oil and other gasolene "barons," which is to say that he has established a laboratory in his home garage in Warwickshire, and is conducting experiments with shale oil and "other indigenous fuels" in the hope of finding a commercial substitute for "petrol," the price of which abroad has soared to lofty heights, as is the case in America. According to his historian, Knight was "active in the United States against the oleomargarine combine, working in the interests of the dairymen for pure butter," and "as he couples a knowledge of mechanics with that of chemistry, the psychological time has arrived for an American to furnish the biggest sensation of the decade in motoring fuel." "Watch for Charles Y. Knight's shale oil fuel!" is the slogan which has been sounded.

Los Angeles Dealers Choose Greer Leader.

At its annual meeting, the Los Angeles Motor Car Dealers' Association elected the following officers: P. H. Greer, president; E. Roger Stearns, vice-president; Bonnie Berges, treasurer, and Earl Y. Boothe, secretary. In addition to these officers, the board of directors includes Paul A. Renton, Leon T. Shettler and Clarence Smith.

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BRAKING POWER SCIENTIFICALLY CONSIDERED*

Retarding Power of Motor Car Brakes Reduced to Figures—Frictional Devices That Convert Mechanical Energy Into Heat—What Happens When the Brakes are Locked and the Wheels Slide—Relation of Motor Energy and Gear Ratios to Braking Power.

A car starts under the power of the motor; overcoming a certain resistance, it begins to move. The cause of this movement is the action of unbalanced forces; power is in excess of resistance. Meanwhile the motor is getting up to full power and speed, and the car begins to accelerate. That is to say, at each interval of time the velocity is higher in value than at the beginning of the time interval. In the early part of acceleration the force necessary to produce acceleration is equal to the product of mass and acceleration. This could be safely taken as constant up to the velocity of ten miles per hour. Reaching this velocity, the resistance will begin to increase with the intervals of velocity; that is, the resistance at the beginning of the velocity interval will be smaller than at the end of the interval. This increase in the resistance naturally requires an increase in the power output of the motor. If we investigate the power characteristic of a motor, we find that the maximum horsepower is generally reached at 1,000 feet per minute piston speed. As soon as we reach this point, the further increase of velocity is possible only if resistance decreases. Motor output = resistance; under such condition the car will travel with constant velocity. During acceleration, the car accumulates potential energy, due to its mass velocity; this is a capacity for overcoming a resistance.

If we wish to bring a moving car to rest, we have to consume this energy. A brake is an energy consumer. The most simple known way of consuming energy is by friction. In mechanics we term friction as the product of vertical pressure and friction coefficient.

In a given material the molecules are grouped together with a potential force. That is to say, each molecule will resist outside forces which tend to change its location or to separate it from the system of molecules. The contact surfaces of two materials placed together under a given pressure will deflect into each other. If we change the relative position parallel to the surfaces, certain molecules will break away and the force which retained them in the material will be set free. This force we observe as heat. The force which was necessary to move these surfaces under pressure is the friction resistance. The friction coefficient multiplied by the vertical pressure, gives the friction resistance. Consequently the friction coefficient characterizes the material in respect to its molecular structure, deflection into other materials and molecular potential energy. This friction coefficient will change if we change the temperature of the body, because thereby we disturb the molecular potential energy. Further, it will change if we introduce materials between the surfaces. This will disturb the quantity of deflection of the surfaces into each other. Wear of matter is the consequence of small particles being separated.

The physical duty of a brake is to turn superfluous energy into heat. The capacity

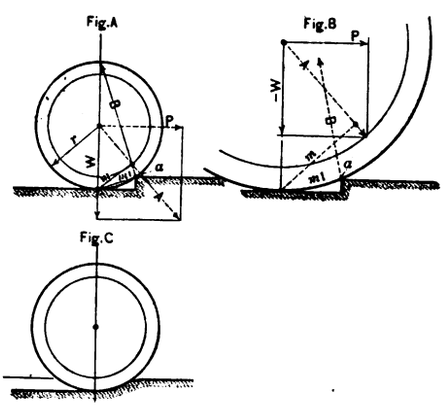


FIG. 1—HOW ROAD RESISTANCE ACTS.

of a brake to transform kinetic energy into heat units in one second is equal to the heat equivalent of the work unit, multiplied by the surface, by the friction coefficient, by the pressure on the unit surface, and by the velocity of unit distance per second.

. . .

If a wheel rim with an axle pressure could roll on a surface without any deflection, such a condition would be rolling without resistance. A wheel rim under the pressure of the axle is deflected into the ground and leaves a path. The quantity of work required to make the path of interval length in an interval of time is the measure of work consumed by resistance.

In Fig. 1 C represent the method of action of the resistance. In Fig. A if we imagine the ground resistance concentrated at the point a, then to make resistance and effort equal would require the following balance:

$B \times m_1 = A \times m$, where B = the effort of resistance; M = the lever of resistance; W = weight of car; A = the actual effort of the car, produced by the two components of P and W.

From this we see that r, radius of wheel, must be taken into consideration, because resistance is a function of the radius, of the weight, of the velocity, of the axle pressure and of two constants, one of the latter varying with the velocity. To illustrate the influence of radius shown in Fig. B, taking the same weight W and the same P,

$A \times m$ is greater than $B \times m_1$

From these many variable quantities, we can readily see that determining road resistance by any approximate formula or by any values given by tables taken from experiments made on a certain car is a very uncertain method.

During the designing of a motor car, it is very advantageous to know the accelerating condition, as giving data of the resistance variation at different speeds. Such a curve assists in fixing the gear ratio, because this is a function of both the resistance and the motor characteristic. Furthermore, it gives sufficient information as to the necessary brake capacity of the car.

The speed-time curve (Fig. 2) merely illustrates the acceleration and retardation of the car. It is not necessary for brake calculation. It is plotted so that the time integral is distance traversed. In Fig. 2 tangent O A, to the speed-time curve, is the acceleration with constant force and resistance. O B is the acceleration or speed-time curve. This is plotted so that the change of resistance with constant force in the time interval will produce a variable acceleration a. When the car reaches a velocity of ten miles per hour, we may assume that the motor will develop normal horsepower; meanwhile, the motor developing full horsepower, the car begins to accelerate. During the early part of acceleration the power is in excess of resistance. This excess unbalanced power will cause acceleration. At a certain velocity the car reaches a constant velocity. This velocity is on the line B C. While reaching this velocity, the car accumulates an energy which is capable of acting against retarding resistance before being brought to a rest. The capacity of this work equals the energy which was used to bring the car from the state of rest to this actual velocity. The value of this work is

$$M \times \frac{v^2}{2} \text{ foot-pounds}$$

At the moment when we disconnect the motor we will have a resistance which will retard at the rate C D. This being the action of the smallest resistance the travel

* Paper to be read at the annual summer meeting of the Society of Automobile Engineers, June 27-29, by S. I. Fekete, of the Hudson Motor Car Co.

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will be the longest; it will take the longest time to consume the energy had when disconnecting the motor. This action of resistance we call the minimum brake effect.

The possible maximum braking effect on a car is the locked condition of the wheel. In such case resistance is equal to adhesion and the rate of retardation is shown by the curve C E in Fig. 2. The requirements of a set of brakes are those shown by a curve near the maximum brake, as indicated by line C F. Between C D E C are all the possible brakes within the limits of brake maximum and brake minimum.

The total resistance of car motion is the sum of air resistance and road resistance.

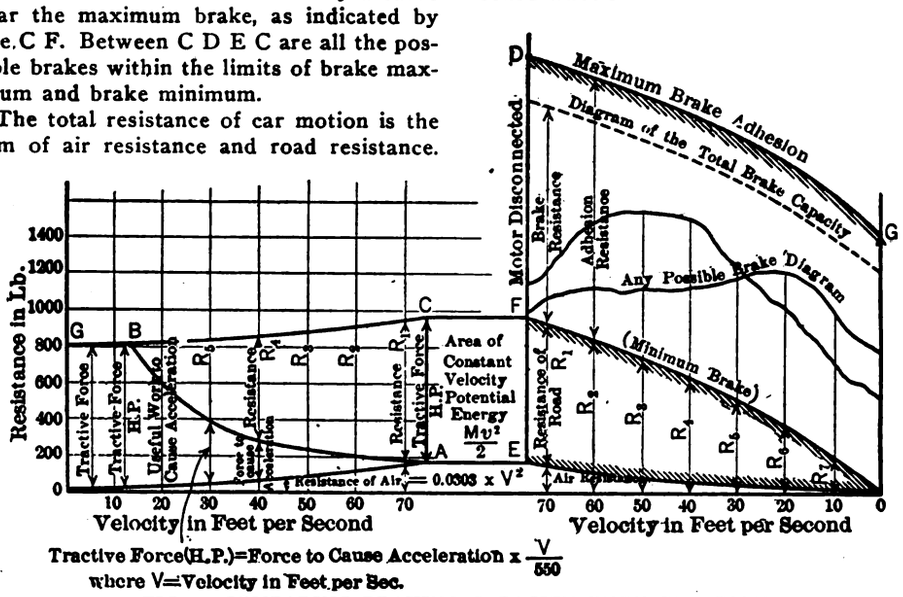


FIG. 3—COMPARING BRAKING CAPACITY WITH TRACTION

The air resistance = $0.0303 \times V^2$, where V = velocity in feet per second. These values are plotted in the curve O A (Fig. 3).

The road resistance may be determined by the acceleration. Suppose the motor develops normal horsepower and a constant tractive force; this will give a straight line G B which represents the tractive force in the diagram of 800 pounds, given by a 25-horsepower motor. Up to the velocity of 14 feet the accelerating force is constant. From point B we may assume a constant tractive force and a constant horsepower output. Therefore curve B C is parallel to the air resistance curve O A. . . .

In Fig. 3 ordinates in the area of B C A will give the resistance due to the velocity. Area C A E F represents the run with constant horsepower and constant resistance. If in D F E we disconnect the motor, we can plot the curve of the minimum brake by first tracing over the curve of air resistance; to this we give the resistance taken from the other side of the diagram (ordinates between B C A). This line represents the resistance without brake. To get the distance traversed when the car comes to rest,

$$\frac{MV^2}{2} = \text{mean resistance} \times \text{distance}$$

$$\frac{Mv^2}{2} = \text{foot-pounds energy} = N_1$$

$$\text{Distance traversed} = \frac{N_1}{\text{Mean resistance}}$$

$$\text{Mean resistance} = \frac{R_1 + R_2 + R_3 + \ldots Rn}{n}$$

The braking effort is the sum of minimum brake plus the action of brakes. The maximum brake is adhesion plus minimum brake.

First—Road resistance can be determined by the acceleration, the power output and the weight of the car.

Second—The ideal braking capacity of a car should be near to the retardation due to locked wheels.

The braking resistance given by the tangenital effort of a brake is equal to

$T \times R = Re \times R_1$, where T = tangenital effort; R = radius of brake drum;

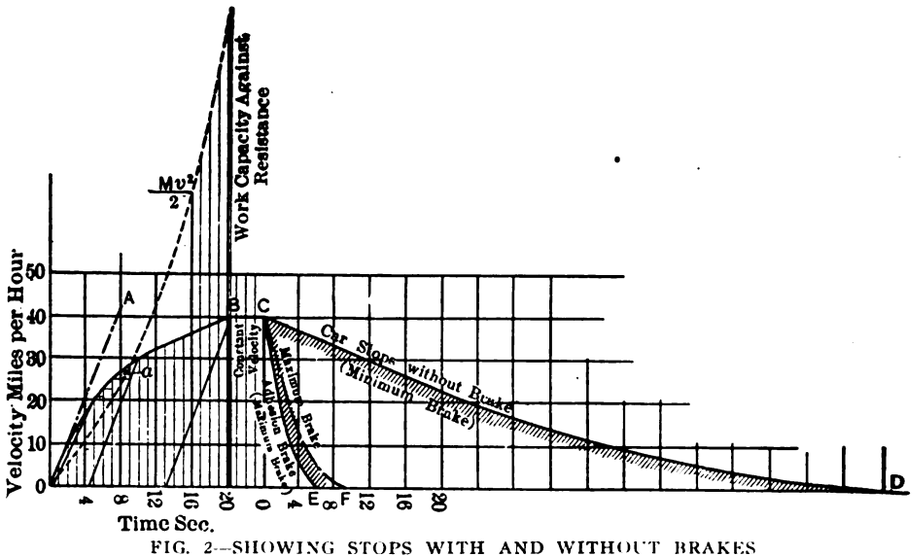


FIG. 2—SHOWING STOPS WITH AND WITHOUT BRAKES

Re = braking resistance; R_1 = radius of wheel.

Damage Claimants Gain Advantage.

While few favorable results in the main have attended the efforts to get some one finally to pay for damages sustained three years ago by William Fickert when he was struck in New York City by a taxicab owned by the Willis Cab & Auto Co., the prosecutors of the action gained an advantage this week when Judge Lehman in the Appellate Term of the Supreme Court for New York county rendered a decision favorable to the Fickert side of the argument and ordered a new trial. The case now is entitled Willis Cab & Auto Co. vs: General Accident, Fire and Life Assurance Corporation and is brought by the cab company, against which a judgment for damages was secured, to force the insurance company, which carried the cab company's accident insurance, to pay the claim. The first trial resulted in a decision against the cab company, the insurance company being awarded a counterclaim of $370 for unpaid premiums. This decision is reversed.

Uncle Sam Rules on Imported Charts.

When is a chart not a chart? was substantially the question decided last week by the Board of United States General Appraisers as the result of a protest filed by George W. Sheldon & Co. against the duty levied by the collector of the port of Chicago, whom the appraisers' board unheld. The merchandise consists of articles of paper lithographically printed, which exhibit in a pictorial manner the outline, form and mechanical features of either a locomotive or an automobile. The various parts are accurately shown by superimposed paper flaps arranged in proper order, and which are hinged so that they may be turned back to show the interior mechanism of the machine or engine. The goods were assessed with duty at 25 per cent. ad valorem under paragraph 416 as "charts" and they were claimed to be dutiable at 20 cents per pound under paragraph 412 as "articles of paper lithographically printed." While the witness for the importers described the articles as lithographic models, the board is of the opinion that these graphic reproductions are fairly within the ordinary meaning of the term "charts," as they are designed for the use of students and are in no different class than the anatomical charts which had been passed upon in a previous abstract.

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INVENTOR'S STATUS ONE OF HONOR

Benefactor Rather Than Beneficiary and Ranks With Author—Standing Recalled from High Patent Authority.

"In these days of ignorant and sarcastic criticism of the patent law of the United States, of owners of patents, and of inventors generally, it is refreshing to read the remarks of Albert H. Walker, Esq., the author of 'Walker on Patents,' the first edition of which was published in 1883," writes Milton Tibbetts of the Packard legal staff, "and whose remarks have come down through the several editions to the present day, as follows:

"'The right of property which an inventor has in his invention is excelled, in point of dignity, by no other property right whatever. It is equaled, in point of dignity, only by the rights which authors have in their copyrighted books. The inventor is not the pampered favorite or beneficiary of the government, or of the nation. The benefits which he confers are greater than those which he receives. He does not cringe at the feet of power, nor secure from authority an unbought privilege. He walks everywhere erect, and scatters abroad the knowledge which he created. He confers upon mankind a new means of lessening toil, or of increasing comfort; and what he gives cannot be destroyed by use, nor lost by misfortune. It is henceforth an indestructible heritage of posterity.

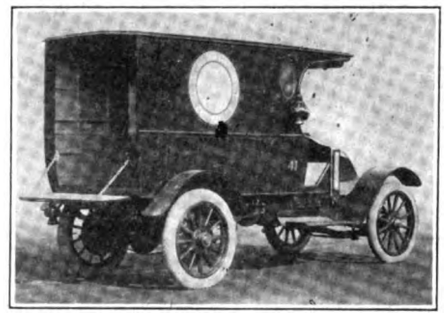
"'On the other hand, he receives from the government nothing which cost the government or the people a dollar or a sacrifice. He receives nothing but a contract, which provides that for a limited time he may exclusively enjoy his own. Compared with those who acquire property by devise or inheritance; compared with those who acquire by gift or marriage; compared with those who acquire property by profits on sales, or by interest on money; the man who acquires property in inventions, by creating things unknown before, occupies a position of superior dignity. Even the man who creates value by manual labor, though he rises in dignity above the heir, the donee, the merchant, and the money-lender, falls in dignity below the author and the inventor. The inventor of the reaper is entitled to greater honor than his father who used the grain cradle; and the inventor of the grain cradle is entitled to greater honor than his ancestors, who, for a hundred generations, had used the sickle. Side by side stand the inventor and the author. Their labor is the most dignified and the most honorable of all labor; and the resulting property is most perfectly theirs.'

Selling Drop-Hammers by Sample a Reality

Heretofore considered impossible, selling drop-hammers "by sample" has become a reality. L. M. Scofield, one of the Billings & Spencer Co.'s salesmen, is performing the apparently impossible feat. Of course, he is not carrying the 5,000 or 10,000 lb. article, but to assist his mission the famous Hartford (Conn.) manufacturers have evolved a miniature drop-hammer, which is an exact duplicate of the real thing. The miniature weighs but 16 lbs. and is of such proportions that it can be carried as readily, or even more readily, than the sample case of the average drummer.

Motor Cars That Help Ice Cream Trade.

That the speed of the motor car makes it especially satisfactory for delivering commodities of a very perishable nature is a fact that is rapidly gaining recognition. Possibly there is no commodity that is so perishable, at the time when it is most in demand, as ice-cream, and the use of motor vehicles by ice-cream manufacturers, as might be expected, is growing apace and giving rise to considerable ingenuity. Among the latest installations made for ice-cream delivery is a fleet of five cars built



by the Lippard-Stewart Motor Car Co., of Buffalo, for the Hoefler Ice Cream Co., of that city.

The cars are of the standard Lippard-Stewart capacity of 1½ tons, and are fitted with bodies designed especially for carrying the big tubs in which the sweet stuff is packed in ice. The floors are covered with a water-tight sheathing of zinc to keep the corroding brine away from the metal parts of the car, and the zinc, in turn, is protected by oak gratings, upon which the tubs rest. It is highly probable that if there was any thermal value in what is called a warm color, the ice-cream would stand a very slim chance of reaching its destination. The bodies are painted a vivid orange, with purple striping, and the Hoefler trade mark appears on the panels in purple and white.

Repairing Holes in Aluminum Castings.

A small hole in an aluminum casting, such as a gearbox or a crankcase, can be repaired by drilling out the hole to make it round, countersinking it on both sides and riveting in a bit of soft copper or brass wire of the diameter of the hole, afterward filing it off flush. This is better, when it can be done, than soldering or patching, though obviously it will not answer for holes of any considerable size.

WHY ENGINE STARTERS MAY BALK

Some of the Likely Causes of Their Occasional Failure—Magneto Cams as Possible Mischief Makers.

When a device has been designed to accomplish a certain purpose and fails of that purpose, a reason, or possibly, reasons, must underly the failure. Even though the object of the maker generally may be attained, it is only by eliminating the so-called chance failures that that degree of reliability is reached where the absolute confidence of the user is gained.

So it is with the gas type of motor starter, which, owing to its extreme simplicity and adaptability, has gained high favor. It fails occasionally, and instances are known in which the failure has been stubborn; but usually it has been traced to causes which have to do either with the production of a suitable mixture in the cylinder, or the production of a spark, but occasionally the cause has not been easily found .

When starters of gas type first were applied, the chief source of trouble was the absence of a spark when the motor stopped in any other than certain set positions, and this cause of failure was more frequently the case where, for ignition purposes, the motor was provided with a magneto having a single non-vibrating coil operating through a high tension distributer which was used for starting, than where the older type of separate coil ignition was adhered to. The fault, if the apparatus was in perfect order, lay with the circuit breaker on the magneto which was held open by the cam when the motor stopped in certain positions, and although the same trouble is met with at the present time, and especially with motors with offset crankshafts which never seem to come to rest twice in the same position, most magneto manufacturers have so altered the contour of the cam that greater leeway is afforded and the circuit breaker is closed at all times save when one of the pistons just has passed the firing point, in which position, owing to the compression, it is quite uncommon for a motor to stop. The production of a spark, however, can be made possible, no matter what the position of the crankshaft, by the simple expedient of "bridging" the circuit breaker with two wires connected to a second push button positioned on the dash. By pressing both push buttons at the same time, the spark always can be produced, regardless of the position of the circuit breaker cam. Another cause of failure due to non-vibrating coil ignition is caused by the formation of a weak spark when the button is operated slowly. To obtain the best results the button should be given several rapid pushes so that the circuit is broken quickly.

Where gasolene vapors are used as the explosive mixture, the importance of a cor-

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rect mixture cannot be too well emphasized. With acetylene gas, which forms an explosive mixture when mixed with air in widely varying proportions, the importance of a correct mixture is not so great. It nevertheless is important, as is remarked by the brochure, "The Passing of The Crank," which just has been issued by the Prest-O-Light Co., which says:

"Air is of as much importance to the successful working of the acetylene starter as is the acetylene gas, and it therefore becomes necessary that the operator provide air for starting by stopping the motor with the throttle open.

"An auxiliary air valve on the intake manifold of a motor will greatly increase the successful operation of the starter, as by its use a supply of fresh air would always be supplied by opening this valve when stopping.

"During extreme cold weather as much as three strokes of the pump is sometimes necessary, while in warm weather or when the motor is warm more than one pumpfull will only enrich the mixture to such a point that starting is difficult. Large engines require in proportion more gas than smaller ones—the proper amount for either to be determined by trial."

The use of an auxiliary air inlet positioned in the manifold cannot be too highly recommended, for although opening the throttle does allow an inrush of air, the air is tempered with a charge of gasolene vapors in correct proportion to form an explosive mixture without the addition of the acetylene. As a consequence, when the gas is forced into the cylinders, the air is over saturated with combustible gases, and a slow burning mixture which is hard to ignite is formed. If fresh air is taken in from an auxiliary air inlet, however, a more suitable mixture of air and acetylene can be produced.

With starters of the type where the gas is admitted to the manifold after the spark has been cut off and sucked into the cylinders during the dying revolutions of the motor, if the sparking arrangements are perfect and the proper quality of gas has been admitted to the cylinders, the cause of failure often can be traced to the lack of homogeneousness of the mixture, the heavier acetylene gas having settled to the lowest point in the cylinder, so that the spark wastes its energy on a mixture too lean to ignite. In this case the motor must be turned over by hand. Obviously, with starters of the pump type, the injection of another charge will remedy matters.

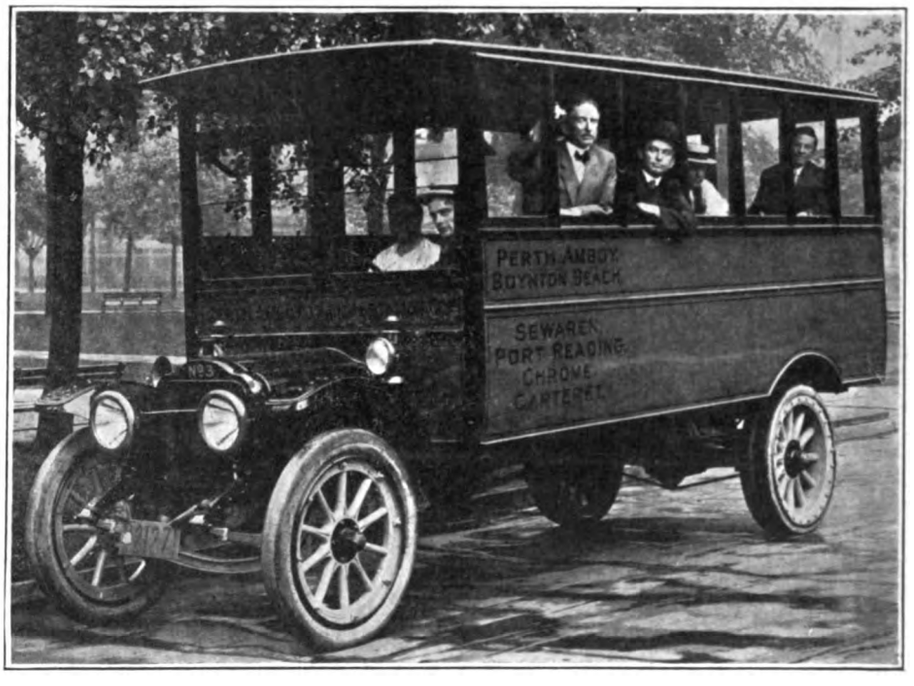
In starters of the pump type, where but a single pump supplies all of the cylinders, care should be exercised to keep each of the check valves which prevent the escape of the burned gas from the cylinder free from dirt and in good condition, for the slightest obstruction will cause an absence of gas in the cylinder so affected, and an abundance in the others. If the starved cylinder happens to be on the firing stroke, cranking will be necessary.

While the possibilities of a four-cylinder motor, which has been well run in so the crankshaft revolves without undue friction and which is possessed with the ordinary amount of compression, stopping on the dead center, are more remote than generally is thought, there still is that chance, and naturally an ignition starter, even though it be in perfect condition, has no effect in turning over a motor which has stopped in this position. The crank absolutely must be resorted to, and the motor given at least half a turn to bring the cylinder next in the firing order into proper position for the engine to start. Obviously if the motor is at all stiff, or if the compression is below normal, the chances of the motor stopping in a position which precludes the possibility of using the ignition starter are relatively greater.

Motor 'Buses That Do Trolley Car Work.

The absence of adequate facilities for the transportation of passengers between Perth Amboy, N. J., and neighboring towns has led to the establishment of a motor 'bus line that is carrying passengers between Perth Amboy, Boynton Beach, Sewaren, Port Reading, Chrome and Cartaret. The equipment consists of chassis of the 1½-ton commercial type, built by the White Co., of Cleveland, O., with 18-passenger bodies, fitted for use all the year round. Electric fans are used for cooling the interiors in hot weather, and for winter journeying heating systems will be employed. It goes without saying, in this age of comparative luxury in motor car building, that the new 'busses are fitted with electric lights and extremely comfortable upholstering.

Perth Amboy, which is the headquarters of the new 'bus line, is not particularly well provided with transportation, for street cars are barred from some of the streets, and there are not many lines convenient to the town. The 'bus line therefore fills a gap that was much in need of filling. It is expected that in the near future the service will be extended by the addition of more vehicles and that other towns will be included in the routes covered.



WHITE MOTOR 'BUS IN NEW JERSEY SUBURBAN SERVICE

Des Moines to Fix Taxicab Rates.

Because the taxicab chauffeurs in Des Moines, Ia., have been unrestricted in the past as to the rates they should charge and have in numerous instances ridden roughshod over protesting passengers who objected to the exorbitant flat rates asked, the City Council has under consideration a measure for the regulation of this traffic. The measure will, it is said, be passed and be put into operation before August 28, when the Iowa State Fair is held. It will require all cabs to have taximeters, and fixes rates as follows: For one or two passengers—First two-fifths mile, 60 cents; each additional one-fifth mile, 10 cents; each four minutes' wait, 10 cents. Special rates not yet decided upon will be made for four and six passenger cars. The rates on four passenger cars per hour probably will be $4.

This is 90 cents for the first mile and 50 cents a mile thereafter.

United States Tire for Electrics.

The United States Tire Co. has added to its productions a pneumatic tire especially designed for use on electric cars and guaranteed for a life of 5,000 miles. In addition to its durability, the new electric vehicle tire is built with a view to economy in current consumption, and the manufacturers claim for it an efficiency of from 20 to 25 per cent. over the gasolene car type of pneumatic tire in this respect.

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THEORY AND PRACTICE IN SPRING DESIGNING*

Importance of Experimental Work in Evolving Luxurious Motor Car Suspension—Spring Steels Considered; Vanadium Alloys Favored Because of Freedom from Effects of Fatigue—Constructional Details and Tests That Bring to Light Hidden Defects.

The design of a spring intended for motor car use presents many difficulties not found in one designed for horse-drawn vehicles or railroad service. The horse-drawn vehicle is built for the same roadbed as the motor vehicle, but speed is not a factor of its design, and although the railroad car is designed for speed, it makes it on a smooth, comparatively unresisting surface.

The ideal automobile spring must fulfill three important conditions: first, it must have sufficient resistance and elasticity to support its maximum load without its shape being permanently altered; second, it must be stiff enough to take care of its heaviest work and at the same time be not too unyielding to slight unequalities of the road; and third, it must decrease the resistance of rolling.

The first consideration in spring design is the steel composition. The ordinary spring steel lacks strength and elasticity and has not the resistance-to-fatigue characteristic of some of the comparatively recent alloy steels. Manganese, nickel, silicon, chromium, vanadium and high carbon steels are used to a greater or less extent, but the best results seem to be given by springs made of alloy steel composition, such as chromium-vanadium, nickel-chromium and silico-manganese. Of these the vanadium alloys are to be preferred. But no matter how good the steel primarily, the secret of the steel spring lies in the end in the heat treatment. A recent comparative table of the physical properties of vanadium and other crucible steels gives the following peculiar properties of vanadium steel. The different steels were oil tempered at 1,500° F. and drawn to 600° F.

	Tensile Strength. Pounds Per Sq. In.	Elastic Limit. Pounds Per Sq. In.
Carbon	126,300	101,100
Nickel Chromium	150,300	134,500
Nickel Chromium Vanadium	163,700	152,300
Chromium Vanadium	233,090	210,500

Vanadium steel is practically non-fatiguable and consequently does not become crystallized under the repeated shocks to which a spring is subject. According to one authority, Wm. E. Snow, from one of whose articles the above table was taken, a crucible carbon steel spring was broken by 125,000 alternations of the testing machine, while the chromium, vanadium steel spring withstood 5,000,000 alternations and remained unbroken.

In taking up the design of the spring as regards shape, number and thickness of leaves, etc., the use of existing formulae must be regarded as merely a basis for determining just what is required under the known fixed conditions. By experimentation alone can a spring be built most nearly approximating the ideal for its particular case. There are certain fundamental rules which must be followed in all cases, but no formulae can be depended upon to give the best results under the varying conditions of motor car use. A long spring is more limber than a short one. The narrower the spring the more limberness it has. Increase the number of leaves and the stiffness is increased. The more the angle of the spring curvature arc is decreased the stiffer the spring becomes. The spring's resistance to load also depends on the thickness of the leaves. A spring of a given thickness composed of thin plates is much more elastic than one composed of a comparatively smaller number of thick plates.

In regard to the various types of springs in vogue at the present time, the following table was made up from statistics of recent pleasure car models:

Front Springs.	
Semi-elliptic	91 per cent.
Full-elliptic	4 per cent.
Miscellaneous	5 per cent.
Rear Springs.	
Three-quarter-elliptic	58 per cent.
Semi-elliptic	19 per cent.
Full-elliptic	8 per cent.
Three-quarter-platform	10 per cent.
Miscellaneous	5 per cent.

In commercial car practice there is little uniformity, due probably to the relatively recent development of this part of the industry. Semi-elliptic and platform springs are in more general use.

In the design of spring leaves there are several important factors to be considered. Each leaf should be so tapered from the center outward that strains set up when the springs are in action may be distributed gradually. In the same manner the leaves taken collectively should have the same resulting taper, that is, the bottom or top leaf, as the case may be, should be the longer, each succeeding leaf being shorter in length, so that under the load the whole spring will approximate a true arc. In going over a rough road, springs are subjected to considerable side-sway. To take care of this it is advisable to have some means of preserving alignment. Various methods are available. Near the end of each leaf there may be cut a slot into which projects a bead from the leaf underneath; or at the same point there may be formed a rib having a longitudinal movement in the indentation formed by the making of a rib in the leaf above. These ribs and slots should be so placed that each is covered by the next leaf above, resulting in their being out of sight and free from dirt. There is little difference in the comparative value of the shape of the leaf points. The round bevel end is in most common use. Springs more than two inches wide should not have French or diamond points, as they entail unnecessary waste. In most cases the long leaf supporting the master leaf should have square points, especially with a high cambered spring, in the case of which the torsional strain on the master leaf is considerable. As a means of holding graphite or other spring leaf lubricant the leaves may be slightly concaved on both the top and bottom, and the space between filled with the lubricant to prevent rusting of the parts and to add to the wearing quality of the spring by decreasing friction.

The best results of spring suspension can be determined by experimentation only. The front end of the front spring must be anchored securely to the frame, as it takes the forward thrust load. The rear end may be allowed more or less play by means of a suitably designed shackle. The spring may lie in a horizontal plane or be somewhat inclined. In some cases raising the spring slightly at the forward end adds considerably to the riding qualities. The front end eye-bolt must be of such strength as to take care of the bearing load as well as the forward thrust load. It is imperative that this bolt be made of a steel of good anti-fatigue qualities. The front left-hand spring should be so designed in respect to strength that it will properly take care of the downward thrust induced by the torque developed in the motor, which revolves in a clock-wise direction according to the general practice. This torque rarely exceeds 150 pounds, but it is necessary to make trial for accuracy. The suspension of the rear spring depends to a great extent on the design of the chassis distribution of load, etc. If the spring takes the driving effort, the front eye-bolt must be designed to this end. At the present time about 50 per cent. of the American cars are driven in this manner.

In connection with both the front and rear springs it is advisable to so design the spring that the shackle, when the spring is

* Paper to be read at the annual summer meeting of the Society of Automobile Engineers, June 27-29, by Leavitt J. Lane, of the Pope Mfg. Co., of Hartford, Conn.

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under full load, will stand in a vertical position. This is necessary for the reason that under the conditions induced by a light load the spring may rebound and cause the shackle to reverse its position, if the shackle is not kept well up to the vertical plane. It is imperative, however, that under no condition of spring action the master leaf undergo a compound strain.

Two methods may be used to hold the spring leaves in their relative longitudinal position: a bolt through the center of the spring or a band of suitable material shrunk on the center of the spring by hydraulic pressure after it is assembled. As a further means of restraining the spring leaves, the center of each leaf may be slightly indented transversely; the raised portion of each leaf made by indenting the opposite side fitting into the indentation of the leaf below. To take care of the lower leaf the band itself is indented correspondingly. The band should be as hsort as possible and still have sufficient strength, as any increase in length decreases the effective play of the spring. A dead-soft iron is recommended for these bands. When center bolts are used they must be as small in diameter as consistent so as to not weaken the spring too much by drilling through its center. The head of the screw should be of sufficient diameter to afford a good holding surface on the top of the spring.

The spring clips holding the spring to the axle should be of the best alloy steel and be placed as closely to the axle as possible so as not to interfere with the resiliency of the spring. The calculation of the size of the spring clip shank is a rather difficult matter, owing to the varying conditions for which they must be designed. . . . A prominent spring maker recommends the following sizes of shanks for the clip:

Spring widths 2 inches and under.. ½ inch
Spring widths 2 to 2½ inches..... ⅝ inch
Spring widths 2½ to 3½ inches.... ¾ inch

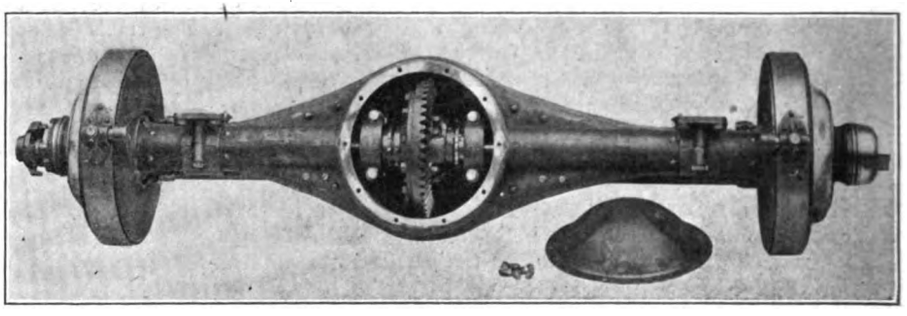
As the most common cause of spring breakage is the failure of the clip or the loosening of the nut or nuts, care must be taken to have some good means of keeping the nuts from working loose. Either two hexagon or square nuts, one single nut and cotter pin, or a castle nut may be used, with a fine thread, preferably the S. A. E. As a further means of retaining the spring leaves in close proximity to each other and in the form of a true arc, the ends of the spring should be provided with one or more rebound clips, clinched around the leaves or clamped by a bolt.

The spring seat between the spring and the axle should conform to both the axle and the spring. A steel casting or forging is suitable, but its length should be the least possible for the same reason as given in the case of spring bands. A formula which gives the length of spring seat as equal to 2½ times the width of the spring has been used, but it can hardly be standardized. Some authorities recommend the placing of a soft metal, canvas or leather pad between the spring and seat to decrease the liability of crystallization. If leather is used it should not be over ⅛ inch thick, so that it will not give trouble when affected by weather conditions. The spring clip plates between the slip and the top of the spring should fit the spring well and not be any larger than necessary to afford a good bearing for the spring clip. A steel forging or a malleable or steel casting may be used.

After a spring is made it should undergo some suitable test before shipment. One manufacturer so designs springs that when completed the arc of curvature is slightly less than required. Then in the final test each spring is compressed until its elastic limit is exceeded and the resulting final set of the spring approximates the arc desired. After such a test a defective spring rarely gets by. Full-elliptic springs should be compressed until they come together. Aside from the final test of the spring, the steel should, of course, undergo the usual tensile strength, elastic limit and elongation tests before being used in manufacture.

Live Axle Built on Girder Principle.

While pressed steel enters into the construction of many parts of the motor car, there is no part that more severely tries out the quality of material and the form of construction than the "live" type of axle, the housing of which frequently is of pressed steel. A particularly striking example of pressed steel rear axle housing work is shown in the accompanying illustration of one of the several designs manufactured by the Metal Products Co., of Detroit. One of the chief advantages of this design is the manner in which the metal is formed into a vertical web, tapering from the enlarged central part of the housing, which encloses the bevel gears, to the spring perches. This form, which is akin to the girder principle, gives enormous strength, particularly for resisting vertical stresses, which are the chief stresses to be borne.



METAL PRODUCTS CO.'S GIRDER TYPE LIVE AXLE

An important feature is the very large opening in the rear side of the housing for the purpose of giving access to the gears and shaft bearings. A close-fitting pressed steel cover, easily removed and replaced, excludes dirt and retains lubricating oil. There is a similar opening on the forward side of the housing, but over this is bolted the extension housing that carries the bearings for the rear end of the propeller shaft and encloses the bevel driving pinion. The Metal Products Company makes other styles of axles, as well as drop-forged front axles of the standard I-beam section. All the rear axles are full floating type and are so designed that either annular ball bearings or Bower roller bearings can be fitted at the option of the user; Bower roller bearings have been adopted as standard equipment, however, by the manufacturers.

While the axle shown is made with a pair each of internal and external brakes, other types are built in which both pairs of brakes are of the external contracting variety, working side by side on a double width brake drum.

About Extension Handles for Wrenches.

A piece of pipe used as an extension handle on a wrench is a good thing, in a way, in that it makes it possible to apply a great deal of power to the work in hand. It is dangerous, however, in many cases, not only because there is a possibility of stripping the threads of the nut or bolt to which the wrench applied, but because there is considerable risk of springing or even breaking the wrench itself. Like many other things, extension handles should be looked upon with a little suspicion and used in moderation and with caution.

To Keep the Hammer Head Secure.

A hammer that is continually flying "off the handle"—literally—is dangerous as well as a nuisance; it may injure someone, probably other than the user, and it may also damage parts of the machine. The proper may to secure a hammer head is to make a saw split in the handle and drive in a wedge of soft wood. A well wedged hammer will stay wedged about as long as the hammer lasts.

How Acetylene Burners May Be Clogged.

Acetylene gas burners will become choked with carbon if the flame is allowed to die low and go out of its own accord after the generator has been turned off. The flame should be blown out.

Rosin a Help in Pouring Babbit.

If a small piece of rosin is allowed to melt in a pot of babbit before the latter is poured into the bearing, a cleaner cast will be the result.

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MARMON FINALLY LAUNCHES "SIX"

After Two Years of Experimentation, Indianapolis Builders Follow Popular Trend —Originalities They Disclose.

Supplementing earlier meagre details of the Marmon "six," which after two years of continued tests in which no small part of its stamina was revealed in the racing exploits of its manufacturers, Nordyke & Marmon Co., Indianapolis, Ind., the car itself formally has been placed on the market; in its lines and construction it reflects many of the individualities and charteristics that have been familiarized by the older four-cylinder "32."

Quite naturally the car is big and roomy and luxurious, as becomes the exemplification of the manufacturer's varied experience, much of which it is given out is the direct result of Ray Harroun's last year's victory in the 500-mile Sweepstakes race on the Indianapolis Speedway. The motor dimensions are 4½ inches bore and 6 inches stroke, and though the rating is but a nominal 48 horsepower, tests have demonstrated that the actual power output exceeds the indicated horsepower by upward of 60 per cent. Though the car follows quite closely the construction of its prototypes of the four-cylinder variety, it differs in one material respect, viz., it is of the left hand steer center control type.

Another of the noteworthy differences is that a new type of steering knuckle of exclusive design has been adopted. The vertical steering spindles are placed directly in the center lines of the front wheels, which construction, it is pointed out, insures easy steering, positive straight tracking and a short turning radius. The method of brake adjustment also has been slightly revised by way of permitting greater accessibility, though otherwise there are few differences from the older cars. The selective change gear mechanism remains unchanged and as heretofore is combined in a unit with the distinctive Marmon rear axle. The types of the Marmon "six" include two-, four-, five- and seven-passenger open bodies and limousine and landaulet. The bodies are mainly of cast aluminum in standard blue-black finish, and the equipment includes a complete dynamo electric lighting system, engine starter, a new type of windshield and top, and the usual complement of tools, spare parts, etc.

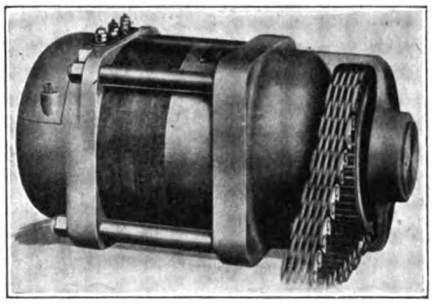
Motor Truck Club Plans for Growth.

Encouraged by the success attendant upon its growth and progress, the Motor Truck Club, of New York City, now proposes to enlarge the scope of its work and influence by throwing open its doors to owners as well as to makers and sellers of trucks. The by-laws are to be altered and the membership is to be enlarged so it will include three class: Active—those engaged in the industry; associate—owners, operators, garagemen, etc; and honorary—consisting of newspaper men and others interested in but not directly connected with the work. The privilege of the floor will be extended to all classes, but the power of voting will be restricted to the active class.

Aplco Develops Original System.

Applicability to a car of any make or model is a feature that in an electric car-lighting and engine-starting system has very obvious advantages. In view of the variations in chassis design, however, no little ingenious planning is required to work out arrangements that will take into account the many peculiarities of car design that must be reckoned with, and for this reason the most recent development of the driving system of the Aplco system, the product of the Apple Electric Co., of Dayton, O., is particularly interesting.

The Aplco system is of that class in which



APLCO DYNAMO-MOTOR

a small electric motor-dynamo is driven by the engine when running and charges a storage battery; the battery furnishes current for the lamps when the engine is idle and also the current which energizes the motor for starting the engine. The motor-dynamo is arranged to be connected with the crankshaft of the engine by a chain drive, or else by flexible connections when the silent chain is impracticable.

To permit this arrangement the clutches that automatically operate to throw the motor into engagement for starting or for operation as a dynamo are enclosed in a casing which forms, so far as outward appearance is concerned, a continuation of the body of the machine. This casing also contains the reducing gears. At its outer end it carries an outboard bearing for the shaft, so that the driving strains are divided between two bearings at one end. The accompanying illustration gives an excellent idea of the neatness and compactness of the design.

It has been found that in very many cars the dynamo-motor can very conveniently be carried on a bracket attached to the frame of the car opposite the point where power is taken from or applied to the engine shaft; a special bracket has been designed for the purpose. These improvements in the Aplco system affect only the method of application to cars; other details remain unchanged.

ANENT THE "OUNCE OF PREVENTION"

Factory Safeguards Recommended by Manufacturer—Most of Them Simple, Inexpensive and Readily Applied.

While the average accident in a factory or shop is probably of small consequence and not sufficient to cause any great loss of time or efficiency on the part of the workman, the compiled loss through a long train of minor mishaps probably would prove appalling if viewed only from the standpoint of a dollars and cents loss to the employer; all of which goes to indicate that precaution and prevention are, as is becoming generally conceded, profitable investments and are being widely applied.

Having this in mind and to spread the good work, the Jay A. Fay & Egan Co., of Cincinnati, O., the big machinery producers, have compiled a set of suggestions which are applicable almost generally and fit the repair shop as well as the factory. They are:

No intoxicated person should be allowed in a plant.

When men are first put to work on dangerous machines, they should be fully instructed how to operate them safely and warned from time to time to follow these instructions. Specially dangerous machines should be operated only by experienced operators, never by boys.

Slow-thinking, heavy men should not be assigned to work requiring quick thought and bodily agility.

Each workman should be made to feel that he is a safety inspector, and that suggestions from him will be welcomed.

Have plenty of room around all machines. Rail off passage-ways close to a machine.

Isolate specially dangerous machines to prevent operators' attention being diverted.

Provide plenty of light. Good illumination means efficiency, economy and profit as well as safety. Whitewash, paint, clean windows and clean lamps help greatly.

Provide good ventilation, as foul air causes loss of both mental and physical alertness.

Keep a plant well cleaned. Avoid accumulations of odd pieces and excess stock on table of machine or on the floor about it. Don't pile up work on the table of a machine.

Safety devices should be installed wherever possible. They will prevent many serious accidents, and often greatly lessen an injury which they cannot prevent entirely. Their use should be insisted upon wherever practicable. A good idea is to paint them red, to help foreman detect their non-use.

Provide all machines with means for quickly disengaging the power and the floor about them with slats, mats, grating, rosin or other efficient means to insure a secure footing.

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Warning signs judiciously used will tend to prevent many accidents.

Employes should stop a machine before leaving it. Oiling or cleaning should not be done while the machine is in motion.

Workmen should be required to wear tight-fitting clothing, preferably with sleeves cut off at elbows. Rolling up sleeves, use of gloves and dressing or undressing near a moving a machine should be avoided.

Trucks should not be overloaded or material piled so that it will topple over.

Keep bandage materials within easy access of all departments, and do not allow an injured employe to continue at work unless his wound has been properly cleaned, dressed and protected.

Provide the best tools and make systematic inspections of all equipment and structures.

Removing Sulphation from Battery Plates.

When storage batteries have been left standing for any length of time in a discharged state, the plates become "sulphated" or covered with a deposit of lead sulphate, which so increases the internal resistance of the battery that the output falls considerably below normal. The treatment where the sulphation is not heavy is simple, merely requiring constant charging and discharging at a slow rate. Other means for the removal of the deposit have to be resorted to, however, in cases where the deposit is heavy and hard. About the best treatment is to remove the plates from the electrolyte and wash thoroughly. Place them in a bath consisting of three parts of water, one part of ammonium hydroxide and one part of ammonium acetate, by weight. After the sulphate has entirely disappeared, wash thoroughly with water and place the plates for one hour in a bath of sulphuric acid, specific gravity 1.100, after which they are again in fit condition for reforming in the customary manner.

Hardening Parts with Heated Lead.

In order to ensure proper hardening of small tools and parts, they should be very carefully and evenly heated, a favorite method among quantity manufacturers being to immerse them in heated lead. When this method is used, however, the parts first should be preheated to approximately 800 degrees Fahr. and should not be permitted to remain in the lead longer than is necessary to heat them through, when they should be removed and immediately quenched in oil, water or brine, according to their substance and the use to which they are to be put.

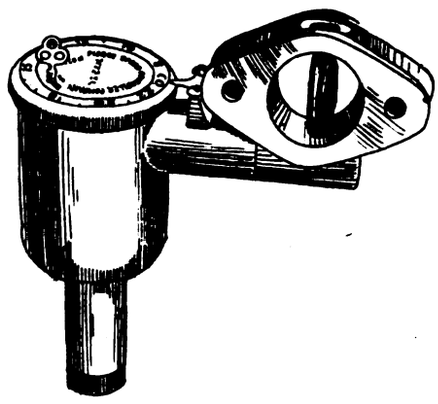
Restoration of Burnt Tool Steel.

To restore burnt tool steel, heat the piece to a red heat, then sprinkle over it a mixture of eight parts of red chromate of potassium, three parts of saltpetre, one-fourth part of aloes, one-fourth part of gum arabic and one-fourth part of rosin. Machine tools treated this way will stand up as well as before they were burned.

GOVERNOR THAT REALLY GOVERNS

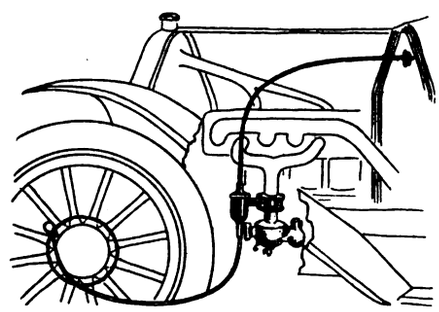
Novel Device Regulates Car Speed Instead of Motor Revolutions—Closes Throttle if Car Exceeds Set Rate.

Automatic governors designed to control the speed of motor cars are by no means uncommon, and the advantage of holding down a car, especially a commercial vehicle, to a predetermined maximum speed is so apparent that many governing devices have been devised for the purpose. With the majority, however, the governor works only indirectly on the car speed by holding



PIERCE SPEED CONTROLLER

the motor down to a maximum R. P. M. rate, without specific reference to the car speed. But there now is available a novel type of speed controller, which has for its



PIERCE CONTROLLER IN PLACE

prime object the regulation of the car speed and has no effect whatever upon the motor as long as the car is running below the maximum speed for which the governor is set. Any attempt to exceed the limit results in the prompt closing of an auxiliary throttle, which slows down the motor at once. The instrument, the Pierce speed controller, is manufactured by the Pierce Speed Controller Co., of Anderson, Ind., and is applicable to either pleasure or commercial gasolene cars.

The governor proper is enclosed in a tight brass casing and is driven, through a flexible shaft, from one of the front wheels, just as a speed indicator is driven. The auxiliary throttle, which is an integral part of the device, is of the butterfly type and is mounted in a housing which is clamped between the carburetter and the intake manifold. In the pleasure car type there is a dashboard control for the regulating dial on the top of the governor, by means of which the limit can be varied at will; in the commercial car type there is no such control. In both cases the dial can be locked at any desired speed. The accompanying illustrations show the construction and the application of the controller very plainly.

When applied to a car the governor holds the machine down to the desired speed without effort on the part of the driver. In the case of a commercial vehicle, where no little damage can be done by reckless speeding, the governor throttles the motor as soon as the road speed reaches the limit, but in case of a hard pull, where it is necessary to speed up the motor in order to obtain maximum power, the governor remains idle, being unaffected by motor speed.

One Way of "Backing Out" a Broken Tap.

It is not always necessary to drill out a tap which has been broken short off in a hole. Sometimes it suffices to bind needles into the grooves in the body of the tap by means of bare copper wire, and inserting the protruding points of the needles in the corresponding grooves in the part of the tap which is broken off. If the broken piece is not wedged too tightly in the hole it can be "backed out."

Filing Operations Facilitated by Chalk.

When filing metals for a finished surface, if the surface of the file is cleaned and given a coating of chalk, it will be impossible for a small piece of metal to stick in the teeth of the file and scratch the surface. The cleaning should be repeated from time to time and plenty of the chalk used on the file if a dead smooth surface is sought.

Simple Means of Filing Thick Washers.

To file down a washer which is slightly too thick is a job which generally is considered "mean," because of the difficulty experienced in holding the work. The best method is to imbed the washer in a block of hard wood which can be held in a vise, when the file can be applied with the greatest of ease.

"Connecting Up" That Requires Care.

In connecting up a speedometer, great care should be exercised to see that the key on the end of the driving shaft of the instrument fits snugly into the keyway on the end of the flexible shaft; otherwise, steadiness and accuracy cannot be expected.

Wrapping that Preserves Oil Stones.

An oil stone is best preserved by wrapping it in a piece of cotton cloth after use. The cloth absorbs all of the lubricant and prevents the formation of "gum" on the surface, which clogs all of the finer pores of the stone.

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LONG STROKE SUITABLE FOR HIGH SPEED MOTORS*

Wilkinson Combats Time-Honored Theory That Only Short-Stroke Motors Should Run Fast—Strength of Materials, Vibration and Lubrication Factors of Importance—Theory of Bore-Stroke Ratios, Relation to Rotative Speed and Practical Effects.

In the earlier days of the automobile industry the ratio of the stroke to bore of a gasolene engine was not a much argued question. Engines of equal stroke and bore were quite common, as well as engines with longer strokes; among the latter, as I remember it, the 4¼ x 5¼ inches engine was very common. Later the square motor became well-nigh universal both in this country and abroad.

It was at this time that the horsepower formula $\frac{D^2N}{2.5}$ came into general use, being adopted first by the Royal Automobile Club of Great Britain and later by the Mechanical Branch of the Association of Licensed Automobile Manufacturers. This formula was meant only as a working one relative to the almost universal practice of equal bore and stroke. As such it served its purpose well, but today is out of date because the practice has changed somewhat. Three or four years ago the so-called long-stroke motor began to come into use abroad. Its use in England was first stimulated by a four-inch race in 1908, in which the size of the engine was limited to a 4-inch bore, stroke not being limited. As the power of a motor can be increased by increasing its size in the direction of stroke as well as bore, this naturally led to the building of motors with strokes of more or less extreme length.

Another strong incentive for small-bore long-stroke engines is the English annual inland revenue tax based on horsepower by the formula $\frac{D^2N}{2.5}$. This tax is pretty high, as can be seen by the following table:

	£	s
6½ H.P.	2	2
12 H.P.	3	3
16 H.P.	4	4
33 H.P.	8	8
40 H.P.	10	10
60 H.P.	21	
Exceeding 60 H.P.	42	

Still another incentive is that the power classification for speed and hill climbing contests all favor the long-stroke motor.

In this country our speed contests are based as far as power is concerned on the volumetric displacement, a classification which I hope to show to be correct scientifically and practically. We have, then, in this country no good reason for the adoption of any stroke/bore ratio other than that which can be shown to best meet our conditions. It is manifestly improper to classify all motors of even stroke and bore as short-stroke and all others as long-stroke.

If we take as the limits the ratios 1 and 2 and divide these into three classes we will have:

Short stroke..... 1. to 1.33 ratio
Medium stroke ..... 1.33 to 1.66 ratio
Long stroke ..... 1.66 to 2 ratio

This would be a reasonable classification for the sake of definition. Most American motors are in the first or short-stroke class.

Theory teaches us that rotative and piston speeds are limited ultimately by the strength of materials. Practice has taught us that with our present knowledge they are limited by other conditions also, such as lubrication, piston cooling and valve cooling; and that these limits are well within those set by the strength of materials. To illustrate this point, select a 4-inch bore x 5-inch stroke engine and take the explosion pressure at 325 pounds. The total pressure on the piston connecting rod and bearings will then be 4,082 pounds. It is a fair assumption that the connecting rod must necessarily be strong enough to withstand this load. Now to find the revolutions such that the inertia of the piston equals 4,082 pounds we resort to the formula

$$F = .00017\ W\ N^2\ S$$

where F = Stress set up by piston
W = Weight of piston = 3 pounds
N = R.P.M.

$$S = \text{Stroke in feet} = \frac{5}{12}$$

Reducing we have

$$N = 4500 \text{ R.P.M.}$$

I think that no one will contend that 4,500 R. P. M. would be a practical rotative speed for a 4 x 5 inch engine.

Practice again has shown that for uses in automobiles considerations of noise, vibration and life of motor have limited our maximum rotative speeds still further, to a figure considerably under that reached successfully by engines of various strokes and bores in many racing cars.

In this country to-day the practical maximum number of revolutions varies perhaps from about 1,600 to 2,000, according to the size of engine. For commercial car uses the tendency in maximum R. P. M. seems to be still more conservative.

Before studying the question in preparation for this paper it had always been the belief of the writer that the long-stroke motor could not properly be run at as high a rotative speed as the short-stroke motor. This, I think, has been the general opinion and was the view of the horsepower formula committee mentioned later. However, I have not been able to find any scientific or practical reasons supporting this view, and will attempt to explain later the reasons which seem conclusive to me why long-stroke motors may be run as fast rotatively as short-stroke motors of equal displacement.

As relating to this question, I show some of the curves and tables of the horsepower formula committee representing the Institution of Automobile Engineers, the Royal Automobile Club and the Society of Motor Manufacturers and Traders. This was a very formidable committee, but their conclusions have been very severely criticised in many quarters. They made tests of 144 engines, 101 of which tests contain all the data required for comparing the effect of stroke/bore ratio on piston speed for values of R from 1 to 1.61.

Change of Piston Speed with Variation of Stroke/Bore Ratio R = S/D Highest Recorded B.HP..

Number of Tests.	Stroke/Bore Ratio.	Piston Speed at Max. B.H.P.
15	1.00 to 1.08	1303 ft. per min.
30	1.10 to 1.20	1240 ft. per min.
24	1.21 to 1.30	1385 ft. per min.
25	1.33 to 1.44	1414 ft. per min.
7	1.50 to 1.61	1597 ft. per min.
101 engine tests		

The report of this committee, including the detail of the data and results of each engine test, is on file in the office of this society and is doubtless familiar to most of those present. I have space here for only a few of the curves from which the committee made their deductions.

The formula deduced by the committee is

$$\text{Piston speed } \sigma = 600\ (r + 1)$$

Such widely varying results do not seem to me to be an accurate basis of arriving at the proper comparative piston speeds of engines. No attempt was made to show that the conclusion is scientifically or reasonably correct. This is like trying to prove a scientific fact by popular vote. There must be some accurate way of making a proper comparison of piston speeds inasmuch as there are no unknown elements to be considered.

In order to discuss more clearly this and other questions pertaining to the paper, let us compare two engines of equal displace-

* Paper to be read at the annual summer meeting of the Society of Automobile Engineers, June 27-29, by John Wilkinson, of the H. H. Franklin Manufacturing Co.

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ment but of varying stroke/bore ratios. I have selected a

4 ½″ × 4 ½″ stroke/bore ratio (1)
and 3.57″ × 7.14″ stroke/bore ratio (2)

Let us assume an equal rotary speed for both, and compare them as to vibration, noise, power, life, control, weight, cost and cooling. The engines, having the same displacement, are of practically the same weight. The crankshafts, bearings, etc., can undoubtedly be made of correct size and strength; therefore, unless we find a wide divergence in the forces set up by inertia of the moving parts,, we will not find a strong reason why one engine can be run faster rotatively than the other.

Vibration in a four-cylinder engine is caused by varying torque noticeable almost entirely at low speeds, lack of running balance of rotating parts, the effects of which increase rapidly with the speed and which are on the average a very noticeable form of vibration, the unbalanced inertia of the pistons due to angularity of the connecting rods, and other vibrations due to lack of rigidity in crankshaft, etc.

The vibration due to angularity of the connecting rods is the only one having a special relation to piston speed, and in high class engines is the one most apparent. As it increases according to the square of the speed, it is most noticeable at high speed.

$F = .00017\ N^2WS$ — represents the force set up by inertia in each cylinder; as N is equal in both engines, the comparative vibration due to above mentioned cause will be proportional to WS or to the stroke × the weight of the piston, the piston-pin and the upper half of the connecting rod. So the engine in which WS is the smallest quantity will have the least vibration. Proper comparison of weights involves similar designs and purposes. In our practice we use pistons as follows:

4½″ = 5.00 pounds
3⅝″ = 2.625 pounds
3⅜″ = 2.375 pounds

From these figures it would evidently be fair to take a 3.54-inch piston as weighing 2.5 pounds. Theoretically pistons should weigh according to the cube of the bore and would do so if made of steel and machined inside and out. Practically, using cast iron pistons, the larger would be a little lighter than the proportional figures.

The cubes of the bore of these two engines are to each other as 48.8 to 100; the practical weights, 2.5 pounds and 5 pounds are to each other as 50 to 100. It therefore seems that 2.5 and 5 must be substantially correct proportional weights. Our 4½ x 4½ rods 9 inches long weigh on the piston pin end 1.25 pounds. A similar 3.57 x 7.14 rod 14 inches long should weigh on same end 1.5 pounds; therefore

W = 5 + 1.25 = 6.25
W′ = 2.5 + 1.5 = 4
W S = 6.25 × 4.5 = 28.12
W′ S′ = 4 × 7.14 = 28.56

These figures are so near alike that we must assume the vibration in the two motors to be practically the same and that there is no basis for the belief that a long-stroke engine is a slow-speed engine on this account.

Now is there any reason to be found why the long-stroke engine cannot be run as fast as the short-stroke? About the only other point to be considered in this connection is the friction between the piston and the cylinder. This is a function of the pressure and the stroke × the co-efficient of friction, which gives the same result in both. We have then two mechanical machines in which the inertia of the moving parts sets up strains and vibrations of the same intensity and duration and which are resisted and absorbed by structures of equal weight and strength and in which the friction caused by such movement is the same.

The question of relative proper speeds is very important in connection with a proper discussion of the question. If it were conceded that of necessity either style of engine is essentially a slow-speed engine and could not be run as fast as the other, this in itself would show immediately an advantage of the one of higher speed capabilities; it would not show in any way that the high-speed motor was not just as good at low-speed work.

If we take the ordinary view of the question that the long-stroke engine must of necessity run more slowly, then to demonstrate its superiority it must first be shown that the slower speed is more desirable and next that at equal speeds it is a better engine. Further, unless it be conceded that the long-stroke motor has equal rotative speed capacity, it follows certainly that lighter, cheaper and more powerful cars can be built with the short-stroke motor.

In regard to noise, which is to-day perhaps the most important question relating to an engine, we note that both engines have the same rotative speed and the same displacement; therefore they must have the same size and lift of valves and cams. So the only point of difference relating to noise will be the greater weight of the moving parts of the valve mechanism in the long-stroke engine, due to the greater distance from valve-seat to cam; the difference is unavoidable, though small, and might amount to 10 per cent.

The question of power speeds being shown to be equal depends on the thermal and mechanical efficiency and the thermal efficiency depends on the compression and wall surface exposed to heat of combustion.

The horsepower committee mentioned admits that its figures supply no evidence of increase of mean pressure with bore, but draws its conclusion from the fact that this is apparent on different engines of the same make and that it is a well known fact that gases in large vessels lose their heat more slowly than when in smaller ones. The first deduction is open to all kinds of criticism and is admitted by the committee itself to be inaccurate. The second deduction is entirely wrong in application because the bore is not a measure of the volume any more than the stroke. The real measure of the loss of heat is the ratio of the wall surface to the volume. The committee might reasonably have said that the greater displacement of the engine, the higher the M. E. P., compression being the same. To go as far as the committee did, the rate M. E. P. from 68½ pounds per square inch in a 2½-inch cylinder, to 99 pounds in a 5-inch, seems to be justified by neither theory nor the facts.

Further, to deduce the effects of wall surface on M. E. P. from results taken at or near maximum brake horsepower, which of necessity was at high rotative speeds, where the sizes of valves, piping and carburetters are by far the principal elements in such M. E. P., indicates a lamentable lack of perception of the problem involved.

In order to eliminate as many factors as possible and to get as nearly as possible the true capabilities of the engine, the M. E. P. was taken at 800 R. P. M., which represented in every instance practically the maximum M. E. P. at any part of the curve. At this speed the effect of valve piping and carburetter sizes is largely eliminated. Of course, the effects of time of valve setting is present in the results and very likely is mainly responsible for the variations. It will be noted, however, that the results are all within a very reasonable percentage of each other and close to what might be expected. No difference traceable to the size, stroke/bore ratio or internal surface as represented by valve-in-the-head or T-head engine can reasonably be deduced.

Two figures are given, one for the bare results, the other with the size of the engine and the style of the head. Knight engines are classed as valve in the head; T.H. = T-Head, L.H. = L-Head, V.H. = valve-in-head engine.

Size of Engine.	Style of Head.	Compression. % Clearance to Total Volume.	M.E.P.
4¾ x 5½	V.H.	17	111
4⅞ x 6	T.H.	21.2	100.5
5½ x 5½	T.H.	21.2	99.5
4¼ x 5¼	V.H.	22	90
4½ x 5	V.H.	22	90
5¾ x 5¾	T.H.	21.9	89
4¼ x 4½	V.H.	22.4	95
4 x 5 15/16		23	101
5⅜ x 6	T.H.	22.7	93
4¼ x 5	L.H.	23	93
3¾ x 3¾	V.H	23	90
4 x 5⅛	T.H.	23	89
4½ x 4½	L.H.	23.5	91
4½ x 6	T.H.	24	97
4½ x 5		24	93
4½ x 4½	T.H	26	90
5 x 5½	T.H.	26	84
4 x 4	V.H.	27	83
4¼ x 5½	L.H.	29	81.5
4½ x 5	L.H.	24	81

I quote the following from a paper by Mr. L. H. Pomeroy read before the Institution of Automobile Engineers in December last:

"The writer has had two engines under observation during the past few months which only differed in respect to their valve arrangement, one having overhead valves, the other being of the orthodox type. The compression ratios were identical and every precaution was taken to eliminate disturb-

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ing factors. The M. E. P. in each case over a speed range from 600 R. P. M. to 1,000 R. P. M. was substantially the same, about 96 pounds per square inch. The influence of marked changes in valve setting was also negligible."

Let us look a little into the theory of thermodynamic efficiency and see if it will give any light. The regular losses in the engine are the mechanical friction, the heat loss to the jackets and the heat going out through the exhaust. The heat lost to the jackets depends on the difference of temperature, the time and the internal surface of the engine exposed to heat. The larger the engine the greater the volume in relation to internal surface and therefore the less the relative heat loss. Lengthening the stroke of an engine decreases the thermal loss, not because the stroke is lengthened but because the volume is increased. Any increase in the size of an engine in the direction of either stroke or bore or both will decrease the thermal loss. It therefore follows that in any given size engine the less the internal surface the higher the M. E. P.,

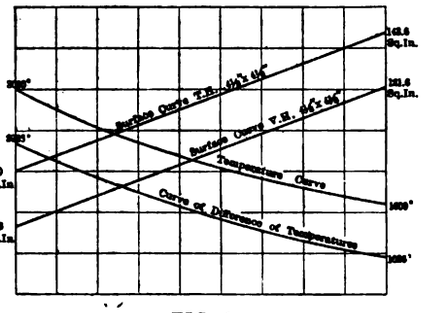


FIG. 1

but both theory and practice show this to be a very small amount. Consider the adiabatic expansion curve in two instances, one of which had no internal surface at all and the other an ordinary engine with a jacket loss of 35 per cent. and an exhaust loss of 45 per cent. The curves are shown in Fig. 2.

The difference in the mean pressure of these curves is about 15 pounds per square inch. Our practical problem then would be: If the difference between no jacket loss and the ordinary loss is 15 pounds per square inch, what is the difference in the case of two engines of a given difference in internal surface?

Our two engines, considering them as T-head with standard size valves, would have internal surface about as follows:

4½" x 4½", 80 sq. in. at beginning, 143.6 at end of stroke.
3.57" x 7.14", 71.8 sq. in. at beginning, 150.8 at end of stroke.

As the heat loss is a function of the difference of temperature and the surface, it is easy to figure that if the 3.57 x 7.14 had a jacket loss of 35 per cent., the 4½ x 4½ would have a loss of about 36 per cent. It is therefore doubtful whether there would be any difference in M. E. P.

If we had one of the engines with valves in the head, our comparison would be as follows:

4½ x 4½, 80 sq. in. at beginning, 148.6 at end of stroke.
4½ x 4½, 53 sq. in. at beginning, 121.6 at end of stroke.

Here there is a substantial difference in internal surface and we might expect a loss in one of 35 per cent. and in the other of

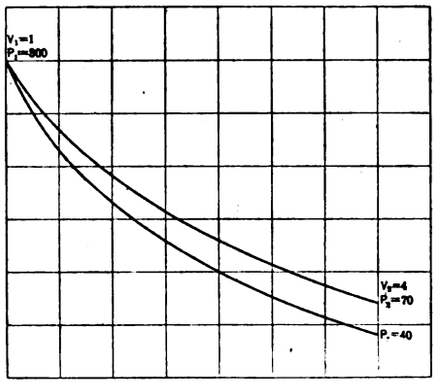


FIG. 2

50 per cent. in the jacket, which might mean 5 pounds M. E. P. difference.

I show some curves (Fig. 7) indicating the surface exposd and the difference in temperature during the stroke. The initial temperature is taken at 3,000° abs. and the terminal at 1,600° abs., and the jacket temperature at 212° and 462 or 674° abs. In the case of the T-head the engine is losing heat at the end of the stroke 66 per cent. as fast as at the beginning, and with the valve-in-the-head engine 80 per cent. as fast. Of course, actually the temperature would drop faster in the T-head motor.

This all goes to show that it takes a considerable difference of surface to make an appreciable difference in M. E. P.

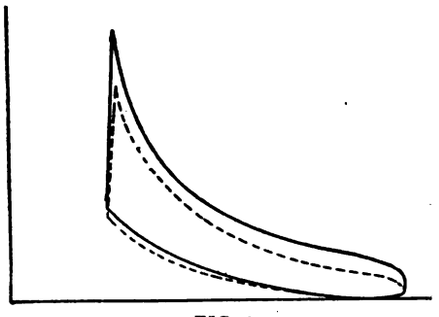


FIG. 3

Another very interesting reason why the M. E. P. does not increase with size was brought out by Mr. F. W. Lanchester, whom I quote as follows:

"There are two factors, other things being equal, that control the mean pressure—the compression ratio and the cooling loss. If we prescribe some definite limiting value to the compression ratio to be employed, then it must immediately be conceded that the larger cylinder will show a higher mean pressure, owing to its cooling losses being relatively less than those of the smaller cylinder. Thus firstly in the smaller cylinder the actual compression will be lower, owing to the greater cooling during the compression stroke, and secondly the heat losses during the combustion stroke will be greater; and so the expansion curve will fall more rapidly (Fig. 3). But as a matter of fact there is no prescribed compression value; the compression is limited by the question of pre-ignition. If an engine is given too high compression, pre-ignition will occur or short of actual pre-ignition the explosions will become of a detonating character, and the engine will be correspondingly noisy. The compression has then to be reduced. Now, the smaller the cylinder the higher the compression ratio permissible, owing to the greater cooling during the compression stroke—in fact, not only may the compression ratio be increased but the actual compression may be higher; for the temperature of the charge at any given compression is actually lower. Consequently the small engine, though sacrificing mean pressure due to its greater cooling loss, will, if properly designed, re-

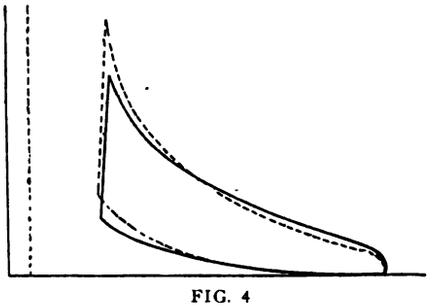


FIG. 4

ceive some compensation from the higher compression that may be employed. The comparison then becomes one as illustrated diagramatically in Fig. 4 instead of as in Fig. 3.

"It is an interesting fact that over the range of sizes commonly employed in automobile work these two influences in many cases almost exactly cancel out. Thus in the Daimler sleeve-valve engine I have found it just as easy to obtain a given mean pressure in a small cylinder (70 mm. dia.) as in a large one (124 mm. dia.). Thus to obtain (at ordinary barometric pressure) mean pressure as shown by the brake in cylinders of the diameters given, the following compression ratios were employed, the figures representing the total volume in terms of the clearance volume":

Cylinder Diameter in mm.	Ratio.
124	4.6
100	5.0
96	5.11
80	5.6
70	6.0

The maximum brake horsepower of our two engines figured from the formula of the above mentioned committee is

4 ½ x 4 ½ — 1800 R.P.M. 96 M.E.P. 55 H.P.
3.57 x 7.14 — 1534 R.P.M. 86 M.E.P. 46 H.P.

The deduction from the argument of the writer is that the variation is not worth

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mentioning. It must be evident that if the figures of the committee are taken that the long-stroke engine is an inferior engine.

The mechanical friction of our two engines differs only in the friction of the wrist-pin, the crank-pin and the main journals. The piston friction being a product of the thrust, the stroke and the coefficient of friction, will be the same in the engines, as the thrust is proportional to the area of the piston and, of course, the area multiplied by the stroke is the same in both cases. Likewise the ring friction will be equal. The other frictions mentioned will be proportional to the area of the piston alone, crankshaft sizes being the same. This friction with a coefficient of .04 will be at 800 R. P. M. about 1.25 horespower for the 4½-inch engine and .75 horsepower for the 3½-inch engine, a difference of .5 horsepower.

The heat lost through the jacket is a measure of the size of radiator necessary. As to the effect of piston size on cooling, it is undoubtedly true that the larger the piston the more difficult it is to keep it cool, but the limiting feature of our present high-speed engines, with necessarily large valves, is more likely the size of the exhaust valve. It is probable that a stroke and bore ratio below 1 might soon be reached where the piston would be more difficult to cool than the exhaust valve, but we are not dealing in practice with such stroke and bore ratios. The tabulated data of American engines show the practice is to use as high compression in large engines as in small ones. So far as the writer knows there have been no experiments in regard to cooling carried on which would show us the relative effects in large and small engines. The writer has never been satisfied that if this element were taken into strict consideration, small engines would not be found superior to large ones in M. E. P. and horsepower per cubic inch of displacement.

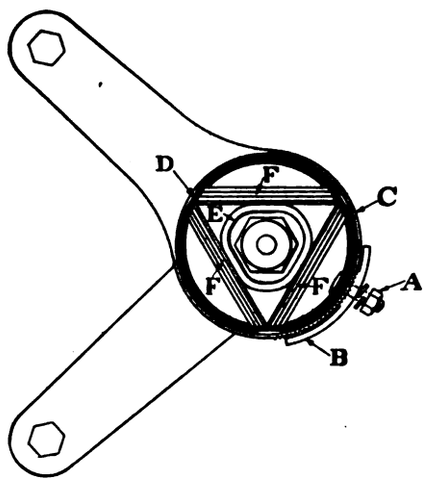
The life of an engine is governed largely by its speed. At equal speeds there are to be noted two differences which must be considered in the design. The piston of the long-stroke engine, being shorter and yet subject to the same total friction, will necessarily wear faster. Likewise the bearings of the short-stroke engine, being subject to greater pressure at the same speed, will require more area. The friction and wear of valve mechanism cannot vary, as they should be the same in every respect.

It might be interesting to note here that any increase of weight due to increasing the life of the piston in one case might possibly be balanced by an increase in the other piston from the desire to get better cooling.

As a purely thermal question there is apparent no reason why the stroke and bore ratio cannot be carried beyond even a ratio of two. But as to mechanical design awkwardness begins to be apparent at ratios beyond 1.33; and beyond 1.5 the objections become more or less acute, running into weight and expense without any compensating features. Any extra long stroke involves too much weight in the valve mechanism and a strong temptation to too short connecting-rods to keep down the height and weight. With L-head engines a design beyond 1.33 exaggerates the valve pocket design. On the other hand, in block engines with two-bearing crankshafts long strokes shorten the distance between bearings and lessen the thrust, thus diminishing the necessary diameter of crankshafts; and in six-cylinder motors the length of motor is shortened. It might be fair in placing general limits on the stroke bore ratio to say that it is limited in one direction to 1 by the cooling limit of the piston, and in the other direction to 1.5 by the limits of mechanical adaptiveness.

Improving Shock Absorber Adjustment.

Whatever difficulties may have existed in the past with regard to the adjustment of shock absorbers, apparently they belong only to the past, so far, at least, as the Connecticut shock absorber is concerned. The latest improvement on this road-smoother, which is the product of the Connecticut Shock Absorber Co., of Meriden, Conn., is the adjusting device which is shown in the accompanying illustration.



CONNECTICUT IMPROVED ADJUSTER

To adjust the Connecticut shock absorber the car is loaded with its full complement of passengers, plus one, the adjusting nut A first having been loosened. When the passengers are all in place the nut is tightened, and the adjustment has been made. A milled segment, B, engaging with the teeth on the outside of the case C, is loosened when the adjusting nut A is turned back. This permits the ring D to turn to what is neutral position, under the existing load conditions; the cam E and the springs F are brought to the same relative position as the ring, and when the ring is locked by tightening down the adjusting nut the other parts are locked at the same time. They require no special attention, falling into place automatically when the adjusting nut is loosened.

When in neutral position the springs, pressing on the flat faces of the cam, have very little retarding effect, but upon moving either way from neutral the cam "toes" are forced against the springs with a pressure that increases with the movement away from neutral, and thus check excessive depression and rebound of the car body when obstructions are encountered.

Vanadium Valuable for Varied Uses.

Where steel components of motor vehicles are subject to continual and severe vibration, to say nothing of occasional overload, it has become common practice for some time past to form these parts from vanadium steel, which, owing to its toughness and because it is not subject to "fatigue" or crystallization to the same extent as ordinary steel, has been found ideal for the purpose. That the metal really is improved by the addition of vanadium in correct proportions and that this fact is fully realized and recognized by the producers is indicated by the fact that "all vanadium steel" cars are realities, and by the general tendency on the part of an increasing number of manufacturers toward the incorporation of vanadium steel parts, even where such parts are not subject to excessive vibration and overload.

That the addition of slight amounts of vanadium to other metals which enter into the construction of the motor car and especially to the cast iron from which the cylinders, pistons, etc., generally are moulded, will open the way toward further reduction in weight and make for more durable motors, seems to be clearly indicated. Not only does the addition of vanadium to cast iron increase the strength of the product from 10 to 25 per cent., but it exercises a very strong effect on the grain of the iron, causing more even distribution of the graphite with consequent greater freedom from both hard and porous spots. Vanadium also gives an element of toughness to the cast iron which is very apparent in machining the castings. Not only does this toughness make the machining more easy and certain of success, but together with the inherent closeness of grain of vanadium cast iron makes it suitable for use in cylinder castings, piston rings, etc.

For two years back the M. Rumley Co., which makes Oil-Pull motors and farm and road tractors in its factory at La Porte, Ind., has used nothing but vanadium cast iron piston rings and is credited with asserting that no other rings can compete with the vanadium cast iron product for durability, and that no other ring will retain its elasticity under the high temperatures which are common in oil motors for so long a period as the vanadium steel ring.

Tallow that Assists Soldering of Cast Iron.

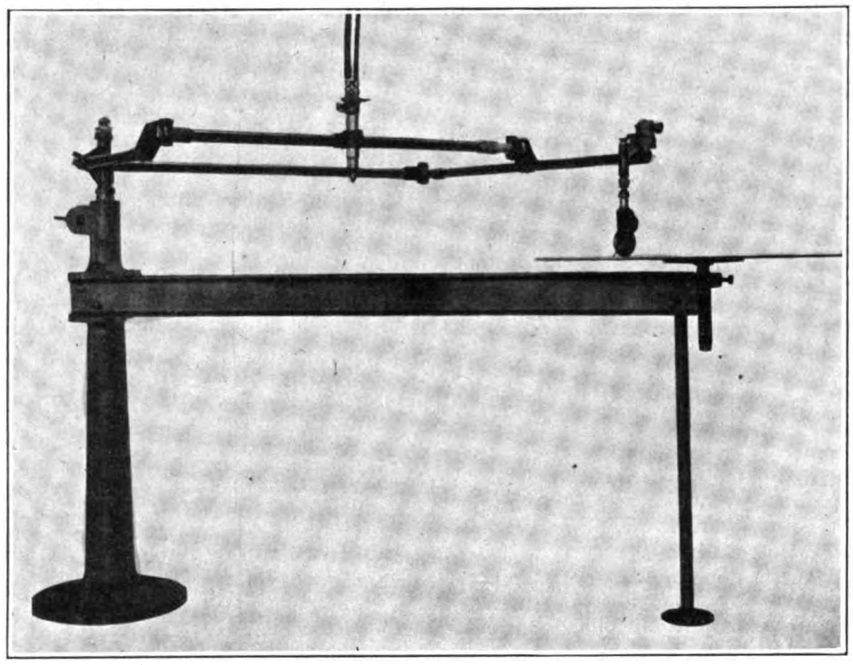
Cast iron can be soldered if the surface is first cleaned with a scratch brush, the soldering acid applied over the part to be soldered and a layer of tallow over the acid. Apply a second portion of soldering acid and solder in the ordinary manner.

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OXYACETYLENE REVIVES CUT SHAFT

Modern Apparatus Bids Fair to Popularize Once Expensive Process—Oxygraph, New Device, May Rival Drop-Forge.

To the use of special apparatus, tools and jigs, some of such simple design that they may be termed the acme of simplicity, others more intricate, but each serving to lessen the time and cost of production, can be attributed the low initial cost of the American built automobile, and each new design, or improvement of an old design, of some labor saving device which tends to increase the facility with which the completed product can be turned out, has an effect on the price of the vehicle.

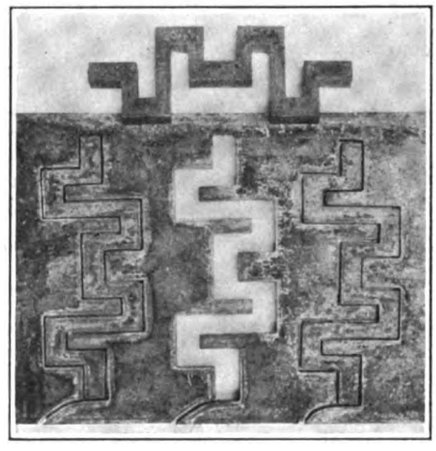


OXY-ACETYLENE PANTOGRAPH FOR CUTTING METAL

Thus, in former years, when motor crankshafts were hewn from flat steel plates the operation involved the drilling of the plate several score times, and the cost was almost prohibitive. Hence the cheaper process of drop forging the crankshaft became the more general practice. With the introduction of the oxyacetylene process of cutting metals, however, the cost of producing crankshafts from flat steel slabs was greatly reduced and each improvement of the process of cutting metals by burning, or of the method of applying the process, has given rise to a display of new interest in the manufacture of crankshafts from the plate, of which the machine shown by the accompanying illustration is a direct development.

The device is made by the Davis-Bournonville Co., which has offices at 88 West street, New York City, and shops at Marion, N. J., and which for some time past has made torches and apparatus incidental to the application of the oxyacetylene process. The new device is termed an Oxygraph and has been designed with a view to facilitating the operation of plate cutting to the last degree. To this end the torch, which is of special design for use of the oxygraph, is carried on one leg of a pantograph and the movement is controlled by the operator through the intermediary of a tracer with which he follows the lines of the cut directly on the blue print and the usual complement of connecting links which go to make up the pantograph. Thus the process of laying out the work to be cut from the plate is dispensed with.

The apparatus consists of a frame supported by a pair of legs on which the work is supported directly under the nozzle of the vertical torch, a flat table on which the blue print or sketch of the work in hand is fastened, and a motor driven pantograph which carries both the tracer and the torch. The operator places the drawing on the tracer table, turns the current through the motor and follows the lines of the drawing with the tracer. The torch follows a similar path over the work, but the distances the torch travels are half those followed by the tracer.



OXYGRAPH WORK

Not only can curves be cut, but right angle corners as well. With oxygen of high quality, the kerf is very narrow and the cuts clean and sharp. The slight width of the cut can plainly be seen from the second photograph, which shows three crankshafts cut from a three-inch steel plate. It is stated that the apparatus will cut three-inch plate at the rate of six inches a minute.

How Agricultural Motors Will Be Tested.

In the Canadian agricultural motor trials, which will occur in Winnipeg, July 3d to 30th, the tests will comprise brake tests, ploughing tests, and such others as the judges may deem essential. The brake test of the machines will mean a two hours' run at their greatest load consistent with economy. Subsequently, a test will be made of the maximum horsepower the engines will develop for thirty minutes.

The ploughing test may extend over a period of five hours or longer, the depth of ploughing to be uniform, and as directed by the judges. Competitors may use any kind of plough they wish. In connection with this test the quality of the ploughing which is to be judged by prominent agriculturalists, shall have special reference to evenness of depth of furrow, uniformity of thickness of the furrow slice, straightness of furrow, finish at the ends, etc.

In respect of design and construction the points that will be considered will be the protection of the working parts from mud and dust, dustproof bearings, accessibility to all parts, such as valves, igniters, bearings, ease of manipulation, such as starting and stopping, reversing, and the general handling of the engine.

The trials constitute a feature of the Canadian National Industrial Exhibition, which is held annually in Winnipeg, and which is largely responsible for the fact that in Western Canada the use of tractors and other farm motors is more widespread than in any other part of this continent.

Antelope Finally Secures Its Inning.

Animals of practically every variety, along with numerous other creatures and things, have played somewhat similar parts but only recently has a happening in Texas squared up matters by giving the much neglected antelope a boost. Hitherto this species of four-footed beast is said to have been rather "sore" because it was overlooked, while bears, coyotes and the rest were appearing regularly in automobile news columns. George McEnitre, of Sterling City, Tex., is the man to whom the antelope is indebted. He is credited with the story of how he finds considerable sport in chasing antelopes over the prairies and catching them alive. In his Franklin car he caught the last one but a few days ago.

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1,009,837. Water-Jacketed Cylinder for Internal Combustion Engines. Raymond L. Gruber, Milwaukee, Wis. Filed Feb. 9, 1911. Serial No. 607,523.

1. In an internal combustion engine, a cylinder having one longitudinal half water-jacketed, and the other longitudinal half exposed to the atmosphere and provided with atmospheric cooling surfaces.

1,009,941. Internal Combustion Engine. Walter S. Thompson, New York, N. Y. Filed May 20, 1910. Serial No. 562,415.

1. In an internal combustion engine, the combination with the compression chamber of the engine having an opening in one of its walls, of a rotary valve having a port adapted to register intermittently with said opening and to open thus communication between said opening and the interior of said chamber, and means for varying, at will simultaneously both the points of opening and closing of said communication relative to the cycle of operation within the cylinder of the engine.

1,010,031. Elastic Hub Wheel. Cesare Feroci, Rome, Italy. Filed Dec. 26, 1908. Serial No. 469,346.

1. An elastic hub wheel comprising a hub having radial chambers on its circumference, an inner rim having radial chambers on its inner circumference, spiral springs having their ends resting in the chambers in said rim and hub, and V-shaped rubber blocks located between the adjacent springs and having their ends resting in the chambers in the rim and hub.

1,010,061. Puncture Proof Tire. William W. Lower, Tyrone, Pa. Filed June 24, 1911. Serial No. 635,173.

1. The combination with a wheel felly and rim having clencher flanges, of a tire comprising a resilient casing adapted to interlock beneath said rim flanges, a circumferential series of pairs within the casing, the plates of each pair being radially disposed, cushioning means interposed between the plates of each pair, tending to maintain the casing in distended position, and means operable through the rim to cause the inner plates to spread laterally to interlock the casing with the rim flanges.

1,010,066. Carburetter. Edward C. Newcomb, North Scituate, Mass., assignor to Newcomb Carbureter Co., a Corporation of New York. Filed Oct. 15, 1910. Serial No. 587,145.

1. A carburetter comprising a member having a multiplicity of air supply ports, a valve for controlling said air ports, said parts having a relative movement, the total effective port opening produced by any such movement being substantially proportional to the movement, a member having a fuel supply port, a needle for controlling said fuel port, connections for producing a relative movement between the fuel port member and the needle proportional to the relative movement between the air port member and valve, and means for maintaining under the normal conditions of operation a substantially fixed relation between he heads acting to force the fluids through heir respective ports.

1,010,082. Steering and Controlling Mechanism for Motor Vehicles. Gustavus F. Smith, New Berlin, Ohio. Filed Mar. 13, 1911. Serial No. 614,168.

1. A steering mechanism for motor vehiclue including a rotatable hollow steering shank with a wheel thereon and having longitudinal slots in its walls, an endwise movable shank in the steering shank having a cross head with sprockets protruding through the slots, an endwise-stopped rotatable sleeve around the steering shank having an internal screw thread meshing with the sprockets, and an arm extended from the sleeve having a handle slidably fitting one side of the rim of the steering wheel.

1,010,110. Vehicle Top Bow Holder. Clarence L. Bair, San Francisco, Cal., assignor to Auto Specialties Manufacturing Company, a Corporation of California. Filed May 26, 1910. Serial No. 563,480.

1. A vehicle top bow holder comprising a stock having its upper end grooved to form side ears, an arm hinged to the lower end of said stock and formed with a series of lifts co-operating with the stock to provide separator sockets for the bows, said arm having at its upper end a shoulder adapted to abut the side ears of the stock when the arm is closed and a projection extending from said shoulder and arranged to project between said ears of the stock, a contact piece on said arm in rear of said shoulder, a locking lever having a contact lug to lock behind the contact piece of the arm, and a spring link having its ends pivotally connected to the upper portion of said arm and to said locking lever.

1,010,158. Automobile Fire Engine. Leon B. Lent, Brewster, N. Y. Filed Mar. 18, 1911. Serial No. 615,266.

1. In an automobile fire engine, the combination with a frame and supporting wheels, of a motor, a main shaft driven thereby, transmission mechanism between the shaft and wheels, and a pump directly driven by said shaft.

1,010,184. Carburetter. Carl F. Schulz, Brooklyn, N. Y. Filed Jan. 19, 1911. Serial No. 603,491.

1. A carburetter embodying a fuel inlet valve and provided with an air inlet opening and a mixture outlet opening, an air admission valve arranged to admit air from the air inlet opening into the carburetter whereby it may pass to the mixture outlet opening, said valve being movable by suction toward open position, and pressure-controlling means arranged to balance the pressure of the suction on opposite sides of said valve, at predetermined positions thereof.

1,010,185. Carburetter. Walter F. Schulz, Corona, N. Y., assignor of one-half to Carl F. Schulz, Pennington, N. J. Filed Apr. 24, 1908. Serial No. 429,052.

1. A carburetter having a mixing chamber formed with an air inlet port, a fuel inlet passage open at both ends and communicating at one end with the outer air and at its other end communicating with said mixing chamber, said air passage having imperforate walls, an inspirator located in the air passage, a suction valve controlling the admission of air through the air port, and a spindle movable with the valve and depending therefrom into the air passage, said spindle controlling the outlet from the inspirator.

1,010,230. Tire for the Wheels of Automobiles and Other Vehicles. William Butterfield. Dublin, Ireland. Filed Feb. 14, 1911. Serial No. 608,617.

In a wheel tire, the combination of resilient blocks arranged crosswise on the rim of the wheel, each block having a contracted central portion forming a bulb-shaped head and flanges, a holding block interposed between adjacent resilient blocks and resting on their flanges; the holding blocks having their outer surfaces within the normal outer surfaces of the bulb-shaped heads, and means for slidably securing the holding blocks to the wheel, substantially as described.

1,010,233. Starting Mechanism for Explosion Engines. Christian Christiansen, Kenmare, N. D. Filed Feb. 6. 1911. Serial No. 606,987.

1. In an engine starting mechanism, the combination with the engine shaft and a clutch member thereon, of a cranking shaft, a clutch member on the cranking shaft to engage the clutch member on the engine shaft, a hand wheel shaft parallel with the cranking shaft, a gear connection between the hand wheel shaft and the cranking shaft including a gear wheel slidably journaled on the cranking shaft, a clutch member carried by said gear wheel to engage the clutch member on the engine shaft, and a spring operating to normally disengage the two clutch members carried by the cranking shaft from the clutch member on the engine shaft.

1,010,234. Automobile Tire. Thomas Christopherson, East Helena, Mont. Filed Feb. 7, 1911. Serial No. 607,213.

In a wheel, a felly having upwardly and inwardly extending spaced flanges, one flange thereof being provided with an opening therein, a plurality of hollow metallic spring members mounted on said felly, said metallic spring members having their edges tapering toward the center of the wheel and normally bearing on one another for their entire length, the sides of said members being flared outwardly beyond the felly of the wheel to form a flat tread surface, and means for closing in said flange.

1,010,258. Combined Sectional Tire and Wheel Rim. Frank M. Henry, New York, N. Y. Filed Jan. 11, 1911. Serial No. 601,992.

1. A tire section combining a spherical body, a base secured to said body, and a projection formed on the opposite side of said body and having a flat surface forming a tread for the tire section.

1,010,273. Speed Changing Mechanism. Fred A. Law, Hartford, Conn., assignor, by mesne assignments, to The Columbia Motor Car Company, Hartford, Conn., a Corporation of Connecticut. Filed Feb. 5, 1902, Serial No. 92,677. Renewed July 8, 1907. Serial No. 382,721.

1. In combination in a change speed mechanism, a driving shaft, a driven shaft, mechanism for clutching said driving shaft to said driven shaft, transmitting means for imparting a plurality of different speeds from said driving shaft to said driven shaft including gears sliding upon the driven shaft, and means for shifting said gears, means whereby the speed of the driven shaft may be changed directly to any speed relative to the driving shaft without passing through intermediate speed positions.

1,010,340. Headlight for Automobiles. Lyman O. Amanson and Milton H. Ulrich, Miller, S. D. Filed Dec. 9, 1910. Serial No. 596,541.

In combination with the usual knuckle steering gear of a vehicle, of an internally screwthreaded tube having one of its ends

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secured thereto, a screw-threaded rod adjustably carried in said tube and having one of its ends pivotally connected to the lower end of a tubular member, a coil spring in said member, a rod pivotally supported upon a portion of the vehicle and having its lower end slidably mounted in the tubular member to engage the coil spring therein, an internally screw-threaded tube pivotally connected to the upper end of said rod, oppositely disposed rods adapted to engage in said tube, caps secured to the ends of the oppositely disposed rods and provided with bolt openings, lamp carrying brackets secured to the vehicle and provided with lamp supporting arms, said arms being pivotally connected to said caps so that when the direction of the wheels of the vehicle is changed the lamps will be partially rotated.

1,010,412. Speed-Limit-Signaling Apparatus. Fabius M. Butler, David City, Neb. Filed Jan. 21, 1910. Serial No. 539,227.

1. In an apparatus of the class described, a speedometer, a series of electric contacts carried by the speedometer in the path of the movable member thereof, another series of contacts individually coupled to the contacts of the speedometer, an electric circuit including an alarm and connected on one side to the movable member of the speedometer adapted to engage the contacts thereon, means for connecting the other side of the electric circuit to any one of the second named series of contacts, a visual index, and connections between the latter and the means for connecting the electric circuit to any one of the second named series of contacts for rendering portions of the last named index member visible in accordance with the predetermined speed limit.

1,010,484. Wheel. Roman von Fabrice, Brooklyn, N. Y. Filed Dec. 23, 1909. Serial No. 534,654.

1. In a device of the class described, a driving gear provided with a hub to receive



INDEX TO ADVERTISERS



A

Abbott Motor Co..... 70
Adamson Mfg. Co..... 64
Ajax-Grieb Rubber Co..... 56
American Ball Bearing Co..... 69
American Motors Co..... 65
American Starter & Carburetor Mfg. Co. 62
Apple Electric Co..... 64
Atwater Kent Mfg. Works..... 55
Automobile Supply Mfg. Co..... 69

B

B & L Caster Axle Co..... 68
Badger Brass Mfg. Co..... 67
Baldwin Chain & Mfg. Co..... 56
Bantam Anti-Friction Co..... 62
Barthel, Daly & Miller...Inside front cover
Bartholomew Co. 70
Benz Auto Import Co..... 56
Bosch Magneto Co..... 63
Bossert Co. 54
Bower Roller Bearing Co..... 62
Bretz Co., J. S..... 64
Briggs-Detroiter Co. 66
Brown-Lipe-Chapin Gear Co..... 62
Bush Mfg. Co..... 54

C

Cartercar Co. 66
Century Electric Motor Car Co..... 68
Chalmers Motor Co..... 15
Champion Ignition Co..... 67
Champion Spark Plug Co..... 69
Clark-Carter Automobile Co..... 67
Colonial Electric Car Co..... 70
Consolidated Mfg. Co..... 64
Continental Motor Mfg. Co..... 50
Covert Motor Vehicle Co..... 56
Cox Brass Mfg. Co..... 64
Cramp, Wm., & Sons, Ship & Engine Building Co. 62

D

Dayton Auto Truck Co..... 17
Dayton Rubber Mfg. Co..... 54
Dean Electric Co..... 5
Detroit & Cleveland Navigation Co.... 67
Diamond Rubber Co..... 69

E

Electric Welding Products Co..... 58
Empire Automobile Co..... 70
Empire Tire Co..... 68

F

Federal Miniature Lamp Works..... 57
Federal Rubber Mfg. Co..... 59
Fedders Mfg. Works..... 72
F. I. A. T..... 70
Firestone Tire & Rubber Co..... 72
Ford Motor Co..... 65
Franklin Automobile Co..... 67

G

G. C. A. Mfg. Co..... 62
Goodyear Tire & Rubber Co., The..... 71
Grant-Lees Machine Co..... 54
Great Northern Hotel..... 60
Grossman Co., Emil..... 54

H

Hartford Auto Parts Co..... 1
Hartford Suspension Co..... 8
Havers Motor Car Co..... 66
Haynes Automobile Co. 70
Henderson Motor Car Co..... 65
Hodge & Graves..... 69
Howard Demountable Rim Co..... 54
Hupp Motor Car Co..... 65
Hyatt Roller Bearing Co..... 7
Hydraulic Pressed Steel Co..... 69

I

Ignition Starter Co..... 57
Inner Shoe Tire Co..... 55
International Accessories Corp..... 62
Inter-State Automobile Co..... 70
Invincible Starter Co..... 64

J

Jeffery-Dewitt Co. 12
Jencick Motor Co..... 55
Jones Speedometer 72

K

Kellom & Co., Chas. F..... 55
Kelly-Springfield Tire Co..... 54
King Motor Car Co..... 50
Kinsey Mfg. Co..... 68
Kissel Motor Car Co..... 67
Kline Motor Car Corp..... 67
Knight-Davidson Co. 68
Knox Automobile Co. 6

L

Lauth-Juergens Motor Car Co..... 63
Leather Tire Goods Co..... 55
Lippard-Stewart Motor Car Co..... 9
Locomobile Co. 55
Lovell-McConnell Mfg. Co., Inside back cover

M

McCue Co. 51
McGraw Tire & Rubber Co..... 54
Mais Motor Truck Co..... 66
M. and P. Electric Vehicle Co..... 56
Mayo Radiator Co..... 3
Metz Co. 55
Michelin Tire Co..... 53
Michigan Buggy Co..... 68
Miller, Chas. E..... 3
Minerva Hardware Mfg. Co..... 55
Moline Auto Co..... 60
Mosler & Co., A. R..... 54
Moss Photo Engraving Co..... 63
Motor Car Equipment Co..... 55
Motz Tire & Rubber Co..... 54
Mutty Co., L. J..... 55

N

National-Acme Mfg. Co..... 55
National Gas Engine Starter Co..... 4
National Motor Supply Co..... 54
National Motor Vehicle Co..... 65
New Departure Mfg. Co..... 14
New Process Rawhide Co..... 72
Niagara Sales Co..... 54
Nordyke & Marmon Co..... 66

O

Oakland Motor Car Co..... 65
Owen & Co., R. M..... 55

P

Penn Spring Works..... 54
Perfection Spring Co..... 54
Piel Co., J..... 16
Pittsfield Spark Coil Co..... 69
Prest-O-Lite Co. 54
Pullman Motor Car Co..... 66

R

Rajah Auto Supply Co..... 72
R. C. H. Corp..... 13
Remy Electric Co..... 61
Republic Rubber Co..... 50
Royal Equipment Co..... 72

S

Sackman Mfg. Co..... 62
Sanford Motor Truck Co..... 60
Schrader's Sons, A., Inc..... 59
Shawmut Tire Co..... 70
Sheldon Axle Co..... 2
Sparks-Withington Co. 50
Speedwell Motor Car Co..... 65
Splitdorf Electrical Co..... 64
Springfield Metal Body Co..... 55
Standard Roller Bearing Co..... 55
Stearns Co., F. B..... 66
Stewart & Clark Mfg. Co..... 10
Studebaker Corporation .....Back cover

T

Thousand Island House..... 63
Timken Roller Bearing Co..... 11
Tobias, F. H..... 54
Twitchell Gauge Co..... 61

U

United Rim Co..... 72
United States Tire Co..... 64
U. S. Motors Co.....Front cover

V

Valentine Co., J. H..... 60
Volkmar Auto Starter Co..... 69

W

Warner Gear Co..... 61
Warner Instrument Co..... 57
Weed Chain Tire Grip Co..... 55
Western Motor Co..... 67
Whitney Mfg. Co..... 58
Willard Storage Battery Co..... 54
Willys-Overland Co., The..... 18
Winton Motor Car. Co..... 66

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the hub of the wheel and a plurality of hook shaped spoke engaging members to engage the spokes of the wheel.

1,010,539. Wheel Tire. Frank Vitali, Healdsburg, Cal. Filed Mar. 6, 1911. Serial No. 612,611.

A wheel tire comprising an annular base formed with a circumferential series of radial sockets, a plurality of separate cushion segments formed each with a transverse tongue and lateral shoulders, the tongues fitting in the sockets, means engaging with the shoulders for holding the segments in position, and an outer tube surrounding and held distended at all points by said segments.

1,010,560. Tire Device. Dorah W. Wilt, University Place, Neb. Filed June 7, 1911. Serial No. 631,827.

The combination with a wheel-mounted vehicle having a seat including a back, the back including a movable section which may be tilted forwardly, of a plate spaced from the back, a lid hinged to the movable portion of the back and co-operating with the plate, and upholstering for the seat, the upholstering being carried rearwardly across the lid.

1,010,566. Internal Combustion Engine. Arthur Alltree, Manchester, England. Filed Jan. 19, 1910. Serial No. 538,885.

1. In an internal combustion engine, a stationary working cylinder, having inlet and exhaust ports, a pair of segmental or half-cylindrical slide valves having ports and disposed around said cylinder; and means for operating the said segmental slide valves to bring their ports respectively into register with the inlet and exhaust ports of the working cylinder on both the up-stroke and down-stroke of the valves.

1,010,583. Gas Engine. Ray Carmichael and William Schaibley, Indianapolis, Ind. Filed Aug. 18, 1910. Serial No. 577,768.

1. An internal combustion engine including a fan-shaped explosion chamber, a rock shaft mounted in connection therewith, a piston extending radially from the rock shaft in said chamber with its outer surfaces in engagement with the walls of said chamber, means for causing explosions in said chamber, and means extending through said rock shaft and piston for supplying lubrication to the engaging surfaces of said piston and the walls of the explosion chamber.

1,010,682. Clutch. Frank Palmiter, South Bend, Ind., assignor to Indiana Anchor Fence Co., South Bend, Ind., a Corporation of Indiana. Filed Feb. 8, 1911. Serial No. 607,259.

1. In a clutch, the combination with a driving and a driven member, of a thrust member, wedge members having a sliding interlocking connection with said thrust member for positively shifting the latter in either direction, and means for actuating the wedges.

1,010,688. Spring-Wheel. John C. Rinehart, Washington, D. C., assignor to The Rinehart Resilient Wheel Company, Incorporated, Alexandria, Va. Filed Oct. 15, 1910. Serial No. 587,141.

1. A spring wheel comprising a hub, a sleeve frictionally but slidably engaged over said hub, a rim, and resilient spokes secured to said rim and sleeve, each of said spokes having a central bowed portion lying in a plane at right-angles to the plane of the wheel; in combination with means to limit the revolution of said sleeve on said hub.

1,010,714. Carburetter. George J. Zisch, Newark, N. J., assignor to Thaddeus B. Eiker, Asbury Park, N. J. Filed May 12, 1910, Serial No. 560,810. Renewed Mar. 29, 1911. Serial No. 617,720.

1. A carburetter comprising a casing, a mixing-chamber therein for the air and gasolene or the like, a valve controlling the passage of air and gas through said chamber, a rotary gasolene discharge pipe in said chamber, valve-mechanism for admitting a variable supply of gasolene to said pipe, and means for effecting the co-operative action of said valve, discharge pipe and valve mechanism; substantially as set forth.

1,010,715. Windshield. Edward L. Ackerman, Detroit, Mich., assignor of one-half to Charles E. Chamberlin, Detroit, Mich. Filed May 1, 1909. Serial No. 493,380.

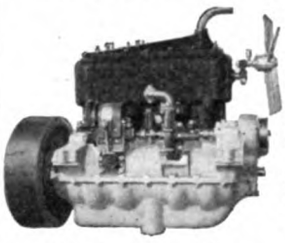
In a windshield, the combination with a lower section mounted for outward rocking movement and an upper section hinged to the lower section for inward folding movement, of a double crank arm extending forwardly from the upper section, a spring connected at one end to the lower section, and a brace connected at one end to the other arm of said crank and at its other end to a vehicle.

1,010,786. Wheel. Edward J. Nelson, Alliance, and Frank H. Lang, Havelock, Neb., assignors of fifty-two one-hundredths to Vaclav F. Hofmann, Havelock, Neb. Filed Apr. 13, 1911. Serial No. 620,941.

A wheel comprising a hub, an inflatable tube carried by the hub, a rim having a continuous outstanding flange on its inner periphery, clips straddling said flange and adjustable thereon, spokes pivotally connected to the clips and having a sliding engagement with the hub, and shoes carried by the inner ends of the spokes, said shoes being in engagement with the aforesaid tube.



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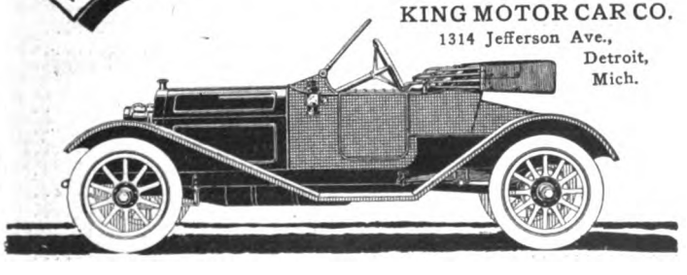
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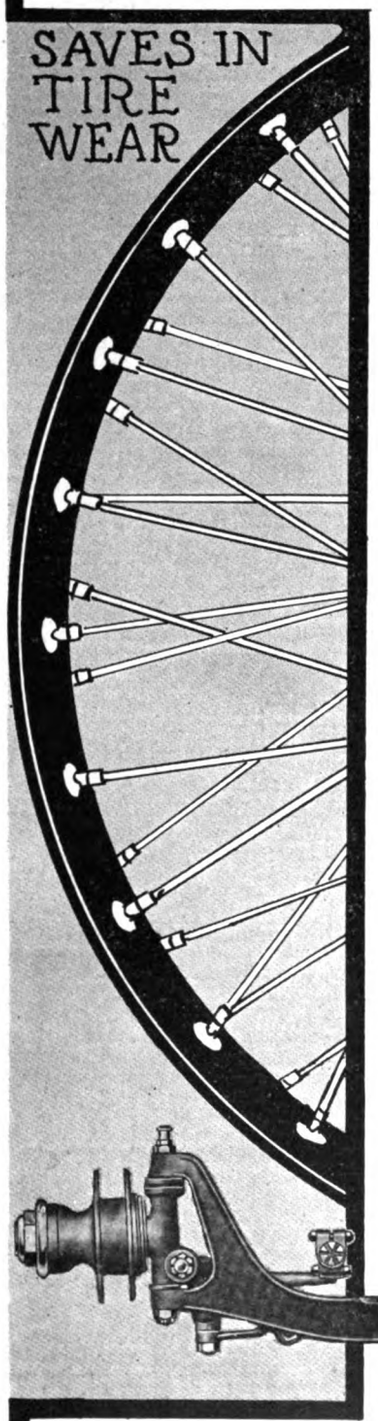
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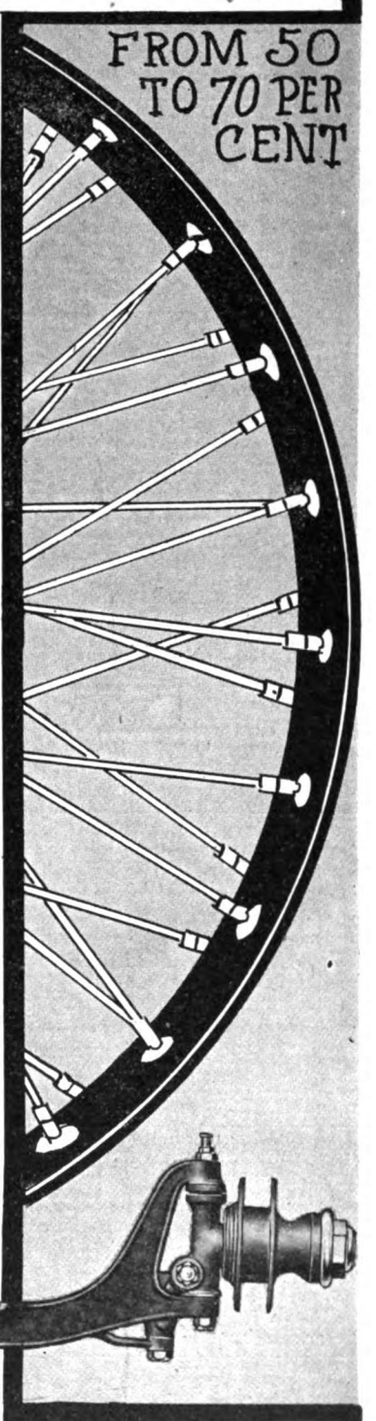
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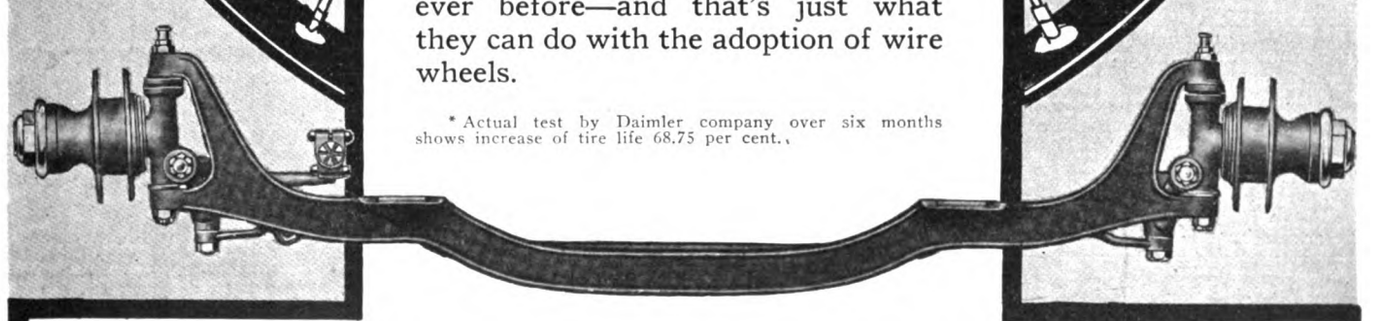
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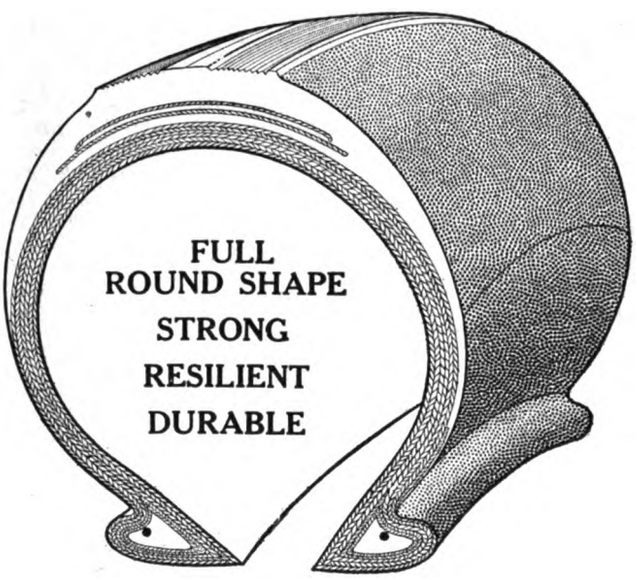
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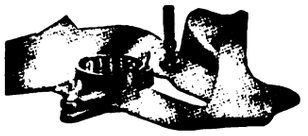
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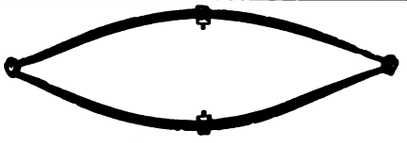
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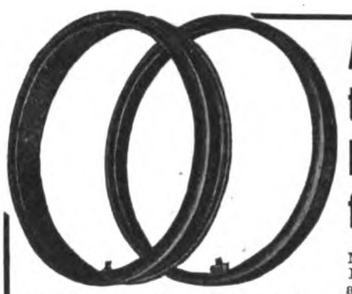
For Pleasure Cars and Light Delivery Cars

Send for Booklet 58

THE MOTZ TIRE AND RUBBER CO.
Executive Office: Akron, Ohio

BRANCHES:
1923 Michigan Ave., Chicago
1727 Broadway, New York
1400 Race St., Philadelphia
900 Woodward Ave., Detroit
409 E. 15th St., Kansas City
2252 Euclid Ave., Cleveland
Standard Tire & Rubber Co., 104-106 Portland St., Boston
Distributors for New England States

A—Shows *double*, notched treads.
B—Shows undercut sides.
C—Shows slantwise bridges.
D—Shows absorbing means when passing over an obstruction.



A Word to the Manufacturer

Marsh Quick Detachable and Universal Tire Rims, from $3.00 to $8.00 per set. Save 40 per cent. Patent locking device to prevent the rings from flying off.

HOWARD DEMOUNTABLE RIM COMPANY, Trenton, N. J.

Send Us Your Inquiries When in the Market for

Sheet Metal Stampings

Estimates Cheerfully Furnished

The Bossert Company
UTICA, N. Y.



Perfection Spring Company

SPECIALISTS IN

Spring Suspension

High Grade Only

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The NIAGARA Self Starter

Is "As Dependable as Niagara"

Simple as It Is Efficient

Good Territory Open

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704 Main Street Buffalo, N. Y.

PREST-O-LITE
The Light Universal

Ask for full information on Prest-O-Lite Gas Tanks, Prest-O-Tire Tubes, Prest-O-Tire Tanks, Prest-O-Carbon Remover, Prest-O-Welder, Prest-O-Starter and Prest-O-Liter.

The Prest-O-Lite Co., 287 E. South St. INDIANAPOLIS, IND.

Glare Eliminator
Screen for Auto Headlights

Tones down headlights for city driving and foggy nights an auto necessity. Price 75c. per pair. Sell like hot cakes. Dealers, secure the agency quick.

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Kelly-Springfield



Automobile Tires

There *may* be other tires as good, but how can you know *which are* good?

The name Kelly-Springfield should save you a lot of *experimental* tire purchases.

KELLY-SPRINGFIELD TIRE CO.
20 Vesey Street, New York

Branch offices in New York, Chicago, Philadelphia, Boston, St. Louis, Detroit, Cincinnati, San Francisco, Los Angeles, Seattle, Buffalo, Cleveland, Baltimore, Washington, Atlanta, and Akron, Ohio.

Boss Rubber Co., Denver, Colo.
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"National" Steam Vulcanizers

GARAGE MODEL repairs three tubes and two casings at a time. Cheapest and best on the market. Get our special selling plan. Portable model for individual owners which will please your customers. List price, $12. Manufactured by

THE NATIONAL MOTOR SUPPLY CO.
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GEARS

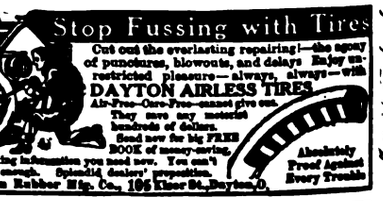
TRANSMISSION, TIMING, BEVELS, HELICALS, WORM

Every gear has a guarantee.

GRANT LEES MACHINE CO.
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Magneto Plugs coax maximum power out of engine.
EMIL GROSSMAN COMPANY, Mfr., New York and Detroit



LBA STORAGE BATTERIES

Class A for Electric Lighting
Class B for Electric Starting

Manufactured by
Willard Storage Battery Company
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Weed Chains

The Great Anti-Skid DEVICE



Nine-tenths of all accidents to automobiles are caused by skidding or slipping.

Either you skid into the "other fellow" or the "other fellow" skids into you.

No matter how careful a driver you may be, you cannot prevent skidding or slipping on wet, muddy snow-covered roads or on icy, slippery greasy pavements unless you equip your car with Weed Chains.

Cannot Injure Tires

Because They Creep

An absolute necessity on both rear wheels and if you want to know what real steering steadiness means put them on the front wheels too.

For your own safety—for the safety of the public, fully equip your car with Weed Chains. Make it your business to get a set today.

Recommended and sold by all reputable dealers

Weed Chain Tire Grip Co.
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The Name "Weed" on Every Hook

Jencick Motors

OF QUALITY

For Motor Trucks

Jencick Motor Corporation
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THE ATWATER-KENT IGNITION SYSTEM
ideal for your motor, write for information-booklet D
ATWATER-KENT MFG. WORKS
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All Standard Bearings
are fully described in our
New Catalog 24 A
Send for it.
Standard Roller Bearing Company
PHILADELPHIA

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"The Best the World Affords"
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Final and crowning achievement of R. E. Olds, pioneer designer of autos. A standard size 30 to 38 horsepower four cylinder car of modern refinements priced for the present at only $1,055.
(38) R. M. OWEN & CO., General Sales Agents
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Woodworth Treads
will help you to increase your business while benefiting your customers. We will send any responsible dealer a pair on 30 days' trial. Write now. Good Agents wanted for unoccupied territory.
LEATHER TIRE GOODS CO., Niagara Falls, N. Y.

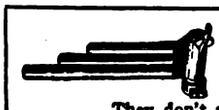
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OF EVERY DESCRIPTION
SAMPLES AND PRICES ON REQUEST
L. J. MUTTY CO., Boston

$495.00 METZ 22 H. P. MOTOR CAR
The most economical car you can buy at any price. The Metz will run from 28 to 32 miles on a gallon of gasoline, over 100 miles on a pint of lubricating oil, and from 8,000 to 10,000 miles on a set of tires. You can secure exclusive sale of these cars in your territory. Book "B" mailed free on request.
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75% Increase in Tire Efficiency
That's what the INNERSHU accomplishes. It's a tough, durable, rubberized fabric formed permanently to tire shape. Ask for circular.
INNER SHOE TIRE COMPANY
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Locomobile Cars for 1912
Complete information furnished on request.
The Locomobile Company
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The National-Acme Mfg. Co.
Automatic Screw Machinery and Their Products.
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MINERVA AUTO HORN
Powerful—Musical
They don't sell on sight, but They do sell on sound.
Write for prices and circular.
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THE MOTOR CAR EQUIPMENT CO.
The Only Exclusive Wholesale Automobile Supply House
Write for Our Complete Catalog and Revised Discount Sheet
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Aluminum Bodies
THE SPRINGFIELD TOP
(Pat. 1895)
SPRINGFIELD METAL BODY CO.
366 Birnie Avenue, Springfield, Mass.

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¶Since the introduction of BENZ cars to the motoring public of America, agencies have been desired, in fact, coveted by many. We are now in a position to offer agency propositions to responsible parties. ¶Also makers of the famous BENZ-GAGGENAU six ton trucks. Choice territory open for agents. Write us today for full details.

BENZ AUTO IMPORT COMPANY OF AMERICA
250 West 54th Street, New York
Direct Branch of BENZ & CIE., Mannheim, Germany

AJAX TIRES

(Guaranteed 5000 Miles)

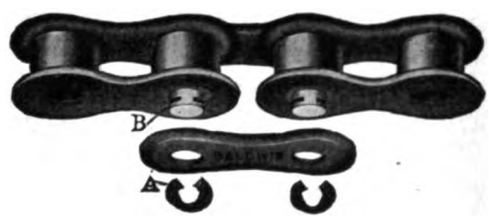
There is Economy in Good Tires

Ajax Tires will save you money in the operation of your car. They will carry you more miles than any other tire on the market. This is true because of their unique construction and the superiority of material used. Our confidence in them is such that we give with every tire a written guarantee for 5,000 miles.

You are hearing more and more about Ajax Tires every day. What they are doing for others in the way of reducing running expenses and upkeep they will do for you.

DEALERS: Ajax Tires offer golden opportunities to the right dealers. Some of the best territory in the country still open. Write for copy of our latest proposition.

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General Offices: 1796 Broadway, New York City
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Baldwin Drive Chains

BOTH DETACHABLE AND RIVETED

are used by the largest, most exacting users of chains for automobiles in the world. They need no further recommendation.



SPROCKETS We are equipped to make sprockets in large quantities at interesting prices.

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M & P ELECTRIC VEHICLES · DETROIT ·

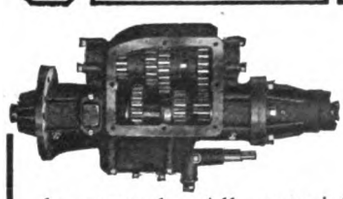
DEALERS—Here is the first electric truck that sells for about $700 less than any other. Capacity 1000 pounds—Service 100 per cent. more than gasoline truck—Economy of production most pronounced. Write.

MADE TO MAKE GOOD & DOES IT



M & P Electric Vehicle Co.
Franklin and Dubois Sts.
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COVERT Transmissions



will help bring your car to the standard of efficiency that you are working for. Every gear shaft and bearing is made of nickel steel, heat treated and accurately ground. All material and workmanship is guaranteed. Will be glad to talk with you about them.

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The Federal Miniature Lamp Works.

HAVE YOU TALKED TO HIM?

Better do it before you place your contract for miniatures. You will save money and get better lamp service.

HE IS UP TO THE MINUTE

on lamp construction, and can tell you what lamp is best suited for YOUR service, why cheap lamps are NOT cheap and why half a million Federal lamps are making good on cars every night.

HE WILL GIVE YOU POINTERS

on Automobile Electric Lighting. If you have troubles he can locate and remedy them.

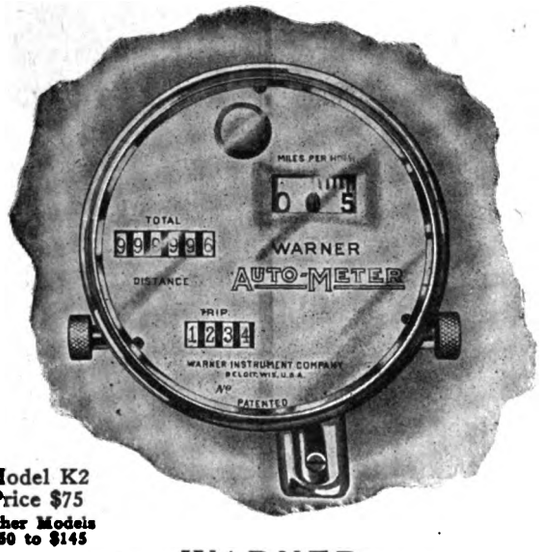
Just drop him a line—either office of

FEDERAL MINIATURE LAMPS WORKS
of General Electric Co.

812 Hippodrome Bldg.
CLEVELAND

Stocks in Both Places
FACTORY IN CLEVELAND

301 Fort Dearborn Bldg.
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Model K2
Price $75
Other Models
$50 to $145

WARNER
AUTO-METER

"The Aristocrat of Speed Indicators"

THE man who takes pride in his car is the one who appreciates the Warner most. He would never disgrace it with anything cheap, inferior and unreliable.

WARNER INSTRUMENT CO., 1197 Wheeler Ave., Beloit, Wis.

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Atlanta	Chicago	Denver	Kansas City	Philadelphia	San Francisco
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This Plug Does It All

Here's the famous STARTER PLUG which makes ANY car Self Starting with ANY acetylene gas starter. It's a perfectly constructed spark plug in every detail—soot proof—reliable—durable—easily cleaned—AND it's the ONLY starter plug besides.

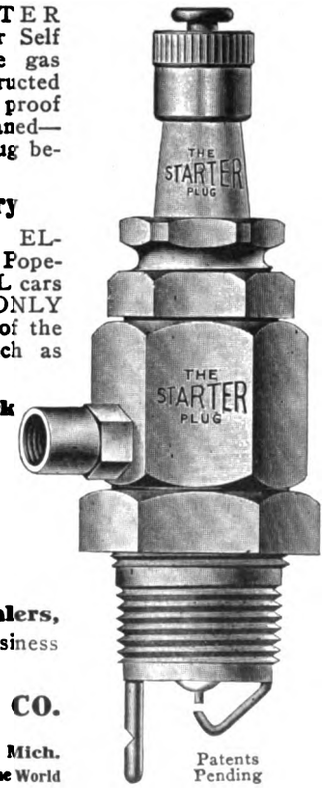
The Picture Tells the Story

For FORDS, BUICKS, ELMORES, Stoddard-Daytons, Pope-Hartfords, Speedwells, and ALL cars having no petcocks, it is the ONLY means of fitting a self starter of the recognized successful type such as the DISCO.

Look for This Trademark

THE STARTER PLUG
Manufactured by J. E. SCHAEFER
Exclusively for IGNITION STARTER CO. DETROIT, U.S.A.

on every box.



Patents Pending

Manufacturers, Jobbers, Dealers, write for terms on this new business builder. It's a money maker.

IGNITION STARTER CO.
Spark Plug Department
615 Dodge Building Detroit, Mich.
Largest Makers of Self Starting Devices in the World

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WHITNEY

The Greatest Mileage

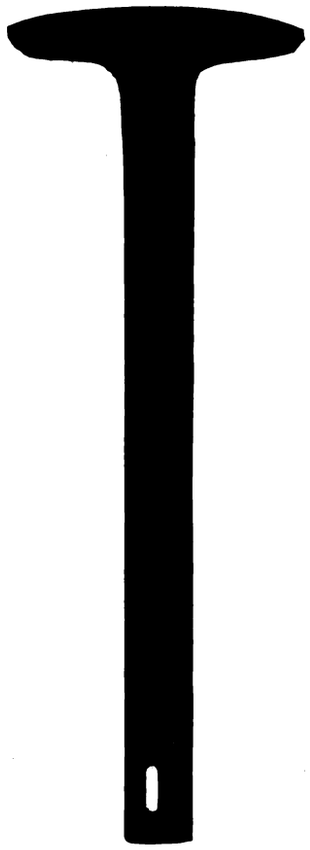
can only be obtained by the use of materials properly hardened which will resist the most wear. Through our untiring efforts to produce nothing but the best and our years of experience in chain making, "Whitney" Chains have gained a remarkable reputation for their strength, accuracy, wearing qualities and ease of repair.

The "Whitney" Cotter Detachable Chain is the most practical chain for motor trucks, because it can be taken apart at any link and lengthened, shortened or repaired without the use of any special tool. When making replacements insist on a "Whitney" and get acquainted with its merits.

Look for the Cotter Pins

THE WHITNEY MFG. CO., Hartford, Conn.





THINK THIS OVER very carefully and read it twice, if necessary.

Is there any part of an automobile engine, or any other gas engine, that is more important to its efficiency than a Valve?

Your engine leaves the factory running smoothly and sweetly—tuned up to its highest power. Perhaps the valves pit—warp - go out of shape—fail to hold compression. Then the power diminishes, and what can be more aggravating to the driver, who has known the fullness of the pulling power of his motor, than to have it grow less and less?

You cannot slight this part by putting in an inferior product—valves that will give trouble, or even break from inexperience in their manufacture—valves of unsuitable material, not suitably heat treated.

Too much is at stake, and a slight extra cost at the outset, which is the exception, may save you many times over a probable later expense.

This Company, with the experience of many years as a guarantee, will furnish you with properly made valves, of the materials best adapted to your requirements.

Not only QUALITY, but efficient SERVICE is a factor—surely there is a satisfaction in getting the kind of work you want—when you want it.

THE ELECTRIC WELDING PRODUCTS COMPANY
CLEVELAND, OHIO

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Mr. Automobilist:

Your tire maker is very anxious to impress upon you the importance of

Tires Inflated to the Right Pressure

He insists that this is tire economy and

Saves You Money

How do you know what pressure you have in your tires? A

SCHRADER
UNIVERSAL
Tire Pressure Gauge

(Trade Mark Registered in U. S. Patent Office)



(Patented March, 1898—Other Patents Pending)

will tell the exact pressure in your tires at any time, day or night, by simply holding this Gauge to your Valve for a second. Its recording sleeve remains in place, showing the exact pressure in the tire so that the Gauge can be taken anywhere and read, at night to the front of the car into the light of the lamps. After the pressure has been ascertained the Indicating Sleeve can be pushed back into the Gauge with your finger. No catches or snaps to operate or get out of order. This Gauge is 2½ inches long over all, short enough to apply easily to the smallest diameter of wheel and can easily be carried in the vest pocket or the change pocket of your trousers.

Price $1.00 Each
Ready for Delivery Now

Guaranteed Simple and Absolutely Accurate

Can be obtained from all tire manufacturers and the dealers, or

A. SCHRADER'S SON, Inc.
28-32 Rose Street New York City

FEDERAL



"Extra Service" Tires

Federal Tires are selected by tire users who demand the limit in mileage and endurance. They are "Extra Service" tires because they are *quality* tires through and through.

Federal Tires are made in Rugged Tread (non-skid) and Round Tread types, for all rims.

Federal Tires are supplied through leading dealers. Interesting tire book free.

FEDERAL RUBBER MANUFACTURING CO., MILWAUKEE

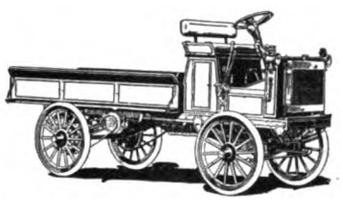
BRANCHES AND AGENCIES—New York, Boston, Chicago, Kansas City, Minneapolis, Denver, Indianapolis, Columbus, St. Louis, Louisville, Omaha, Houston, San Antonio, Little Rock, Atlanta, Los Angeles, San Diego, Pasadena, New Orleans, Portland.

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Sanford

Have you heard our dealers proposition?

Chassis $1600



Stake or Express Body $1750

If you don't know all about our proposition to live dealers it will pay you to find it out before closing for your one ton truck line.

Here is a truck that admits few equals and no superior. Ample motor capacity of the unit power plant type—the greatest lubricating system in operation—and as accessible almost as the driver's seat itself.

The Sanford truck is made by men who have been specialists in one ton truck manufacture for the past nine years.

When shall we call upon you?

The Sanford Motor Truck Co.
SYRACUSE, NEW YORK

DREADNOUGHT

Moline "35"



"King of the Road"

THE phenomenal records made by the "Dreadnought" Moline "35" in winning four great Glidden, Reliability and Economy Tours in the past two seasons have left an impression of "quality" that is publicly recognized wherever and whenever you drive the MOLINE—the car with the famous

4x6 Long-Stroke Motor

Write for Catalog, Edition de Luxe, showing the four new Foredoor Self-Starting Models—Five-Passenger Touring, Four-Passenger Roadster and Two-Passenger Roadster.

Prices, $1600 to $1700 [33]

MOLINE AUTOMOBILE CO.
61 Keokuk Street E. MOLINE, ILL.

Dealers, Why Not Sell "A Car That Sells"? Write.

Self Starter HANNA

Watch the Prices Drop!

Just as the Hanna self starter—the only 100% efficient self starter that does not foul or soot your plugs—was imitated by those who followed our lead so now is the price of the Valentine manifold starter being met.

Remember We Were the Originators

Not only were we the first to produce an acetylene self starter but we were first to introduce a manifold self starter at the right price, $10.

Our Price Does Not Cut the Dealer's Profit

Still some fine territory open. The profit is big. Our goods are right and fully guaranteed. Write today.

J. H. VALENTINE COMPANY
Syracuse, New York

The Valentine MANIFOLD STARTER and Gas Lighter

Great Northern Hotel
CHICAGO

Ideal Headquarters for Automobilists

Rates:
Without Private Bath $1.50 and $2.00
With Bath $2.50 to $4.00



Large, Comfortable Rooms
Grill Room Popular Prices
Cafe on Parlor Floor

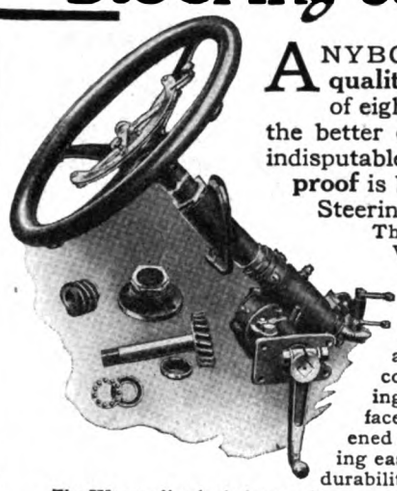
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Most centrally located hotel in Chicago and absolutely of fireproof construction.

Jackson Blvd., Dearborn and Quincy Sts.
JOHN C. ROTH, Managing Director

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Steering Gears



ANYBODY can claim quality—but a record of eight years use on the better class of cars is indisputable proof. That proof is back of Warner Steering Gears.

The prime features of Warner Gears are: accessibility; complete interchangeability; use of eccentric sleeves; adjustable angle of column; large bearing and contact surfaces specially hardened and ground, assuring ease of motion and durability.

The Warner line includes a wide range in both pleasure and commercial types.

We guarantee dependable deliveries.

Get acquainted with Warner Quality—make it another selling argument.

We modify our designs to meet your detail requirements, or build on approved designs on seasons quantity specifications.

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Philadelphia Office
Glenwood Ave. & 2nd St.

Warner Gear Co.
Muncie Indiana

BROADWAY 537 HOME 63479

SUNSET AUTO CORPORATION

CALIFORNIA AGENCY
Havers Six Cylinder 40 H P — $1850.00
Nyberg Four Cylinder 35 H P — $1250.00
Cass Motor Trucks

GARAGE — REPAIR SHOP — STORAGE

1101-7 Figueroa St. Cor 11th Los Angeles, Cal., March 27, 1912.

The Remy Magneto Co.,
Anderson, Ind.

Gentlemen:-

Mr. Rundy who handles the Remy Service Department for the Auto Motor Equipment Co., of this city, has called upon us several times. We have been using Remy Magnetos on our Nyberg line, for several months, and as yet have had been getting satisfactory service from your Magnetos without any attention, whatsoever.

Sincerely yours,
Sunset Auto Corporation.
By. F. Rundy

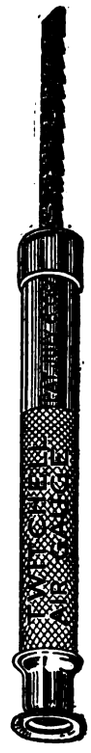
A postal will bring scores of letters like these
Remy Electric Co
Anderson, Ind.

The New Twitchell
Positive Lock Stop
Gauge

Increases Mileage

Decreases Tire Expense

Accurate, Simple and Instantaneous



Insures Correct Tire Pressure

A Vest-Pocket Necessity for Every Motorist

IF Twitchell Gauges were not so accurate and reliable, there would not be so many of them sold.

An inaccurate tire gauge is like an inaccurate watch. Both are worse than useless. As good materials and as masterful workmanship are found in the Twitchell Gauge as in the most delicate, scientific instruments. Therein lies the motorist's protection.

In the course of manufacture, this gauge undergoes four different inspections. It is absolutely simple. Unlike other gauges, it contains no rubber washers to wear out or deteriorate. Neither are its internal or external parts subjected to friction or wear.

Correct pressure in all 4 tires is essential to the utmost tire efficiency—maximum mileage. Otherwise the brunt of the wear and tear of traction falls on your softest tire. You cannot determine a tire's pressure by guess work—you can with the Twitchell Gauge. It can be easily read day or night—the graduated bar remains at the pressure indicated till a slight pressure of the thumb on the extreme end of the ratchet side returns the register to zero. Made to carry in the vest pocket—only 3½ inches long.

Price $1.00 each

Now Ready for Shipment
Can Be Obtained from Your Dealer

CORRECT PRESSURE FOR TIRES

2½-in. Tires	50 lbs.	4 -in. Tires	80 lbs.
3 -in. Tires	60 lbs.	4½-in. Tires	90 lbs.
3½-in. Tires	70 lbs.	5 -in. Tires	90 lbs.

The Twitchell Gauge Co.
1256 Michigan Blvd. Chicago

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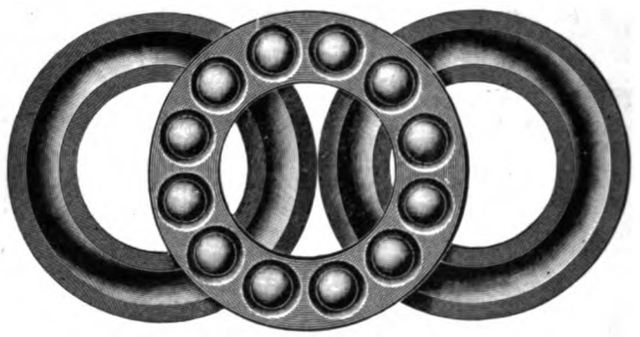
No Cranking! No Pumping!

START YOUR CAR FROM THE SEAT
ALWAYS READY AND POSITIVE

The AMERICAN STARTER is the Only Starter on the market that measures the amount of gas injected into the cylinders. You cannot "dope" the engine with the AMERICAN STARTER.

American Starter and Carburetor Mfg. Co.
2022 S. 40th Avenue CHICAGO, ILL.

WE MAKE THE BEST



BANTAM ANTI-FRICTION CO., Bantam, Conn.

You Need Speedo

IT'S GUARANTEED

Price $3.50 With Recarbonizer High Power Models Upward

It will save you 20 per cent. in gasoline, increase power of motor 20 per cent. and is a positive preventive of carbonization.

How It Works—SPEEDO breaks up, under spray, each particle of gas after leaving carburetor, injecting additional air, automatically. Makes easy cold weather starting and is sold only Under Guarantee of Absolute Satisfaction. Ask your dealer.

INTERNATIONAL ACCESSORIES CORPORATION
Chicago Branch, FULTON-GRUBB CO., 1180 Michigan Blvd.

Better Than Commercially Perfect GEARS

Bevel Differential
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$3,000,000 in plants affording the most superior facilities for fine work; also hardening and treating of the finished product. Most thorough inspection and testing system. Our own laboratory.

Brown-Lipe-Chapin Gear Company
H. W. CHAPIN, Gen'l Mgr. SYRACUSE, N. Y.

Bower Roller Bearing Co.

DETROIT, MICH.

Manufacturers of High Grade
ROLLER BEARINGS
For All Purposes



Our Consulting Engineering Department is always at your service.

Send for catalog, price-list and specification sheets of sizes.

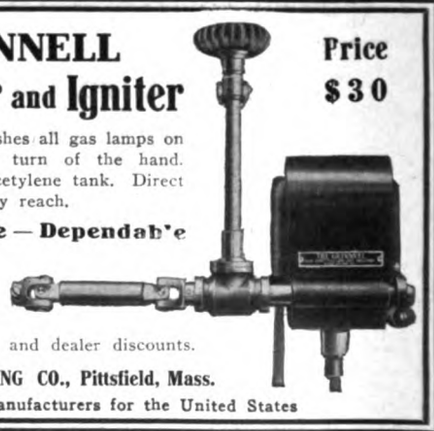
THE GRINNELL Gas Controller and Igniter

Price $30

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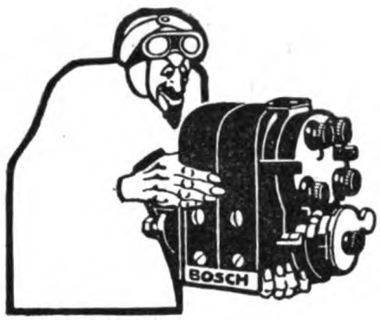
LAUTH-JUERGENS TRUCKS ARE THE LATEST IN construction, most powerful in operation and the motors are guaranteed against defective workmanship and material for the life of the truck. They are positively the highest class trucks made. Two cylinder, one-ton, four cylinder, one, two and three-ton. Four speeds forward. Hess-Bright ball bearing transmission made in our own shops of the finest tool steel, three-piece disc clutch, covered by patents owned by us. Send for 1912 Catalog and specifications. Prompt delivery on all models. Large publicity campaign just begun. Our quality will do the rest.

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CHICAGO—The Lauth-Juergens Motor Car Co., 2630-32 Wabash Ave.
NEWARK, N. J.—Merchants Motor Car Co., Essex Building.
DETROIT, MICH.—Bierl Auto Truck Sales Agency, 453 Dix Ave.
DISTRICT OF COLUMBIA AND VICINITY—Bowles Motor Sales Co., Inc., 1608 14th St. N. W., Washington, D. C.



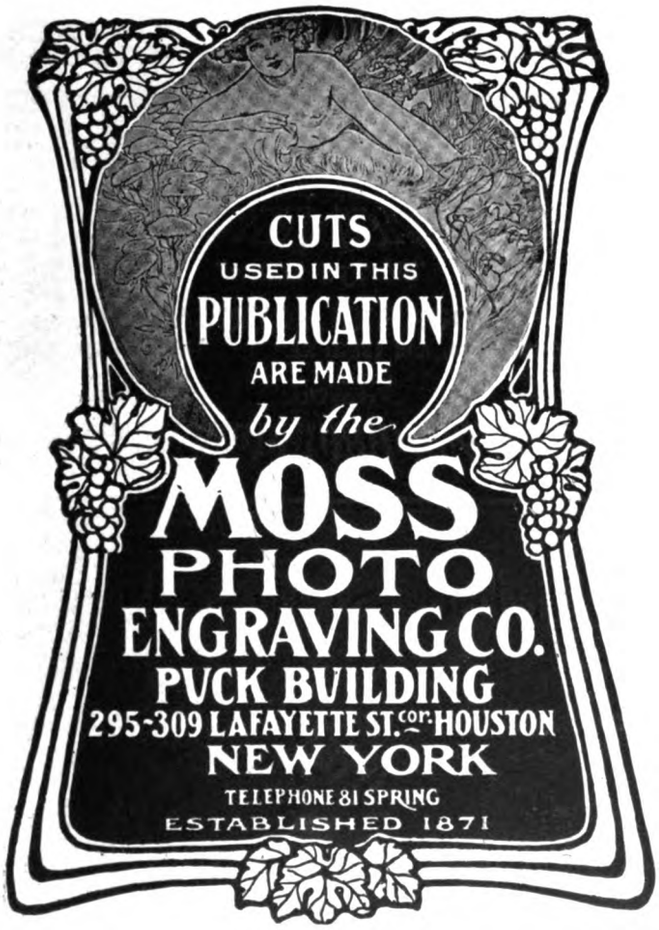
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Its lightest—rightest—most economical—that's the reason we'll make seventy-five thousand of them this year. Prices $590 to $900. Agencies everywhere.
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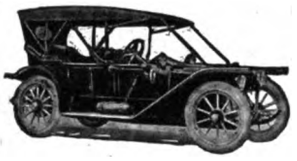
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$2,700
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Touring Car
$900 F. O. B. Detroit

Motor 3¼ x 5½ inches; four cylinders; Bosch magneto; three speed sliding gears; tires 32 x 3½ inches; 106 inch wheelbase. Equipment includes windshield, gas headlights, generator, oil lamps, tools and tire repair kit.
Roadster body on same chassis and with same equipment, $900 F. O. B. Detroit.

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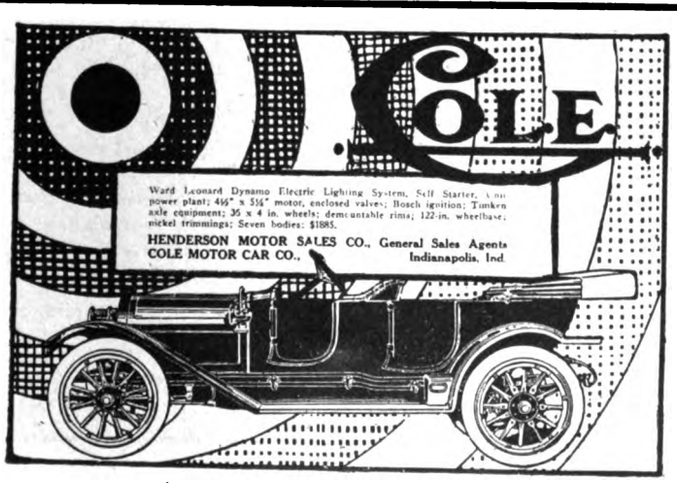


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Ward Leonard Dynamo Electric Lighting System, Self Starter, 4-cyl. power plant; 4½" x 5½" motor, enclosed valves; Bosch ignition; Timken axle equipment; 35 x 4 in. wheels; demountable rims; 122-in. wheelbase; nickel trimmings; Seven bodies; $1885.

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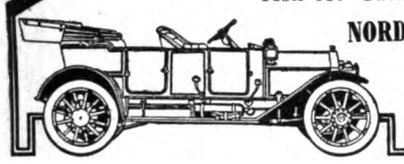
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Havers Self-Starting "Six-44"



Price $1850

SPECIFICATIONS TALK—Six-cylinder Motor, 4-cycle long-stroke type; 44 H. P.; Bosch Magneto; dual system; Model "C" Stromberg Carburetor. 122-inch wheel-base; 36x4-inch wheels; self starter. Springs, semi-elliptic front, platform suspension, rear; rear axle, full floating type.

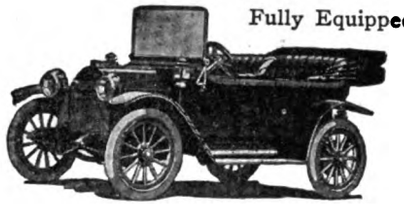
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Factories: York, Pa., Richmond, Va.

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What the Franklin Has Done

46.1 miles on one gallon of gasoline in the economy contest conducted by the Automobile Club of Buffalo.

87 miles on two gallons of gasoline in the economy run held by the Automobile Club of America.

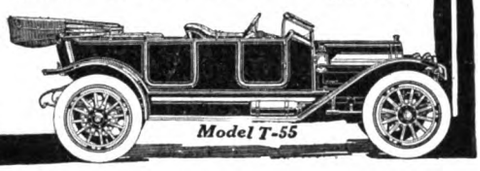
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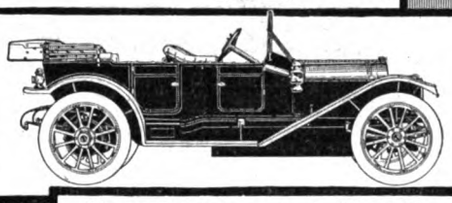
Clarke-Carter Automobile Company
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Model T-55

KISSELKAR

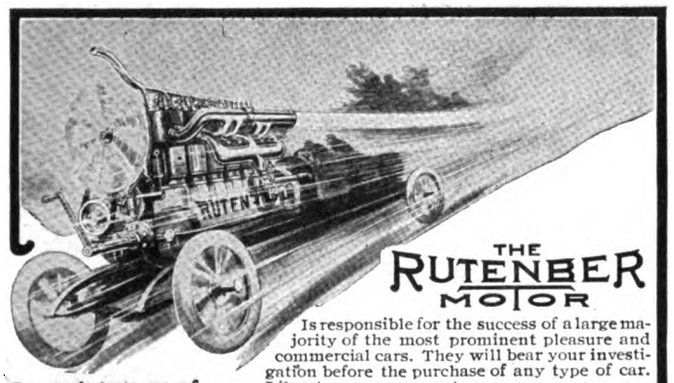
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There are no other motor lamps on the market with the advantages of Solar Lamps. Solars are always exclusive in style and in quality. They are the strongest lamps as well as the most effective.

In no other lamps can you obtain the Solar Special Short Focus Lead Glass Lens Mirror Reflector—the patented system of double ray light projection which gives two distinct fields of light for town and country use—or the new and exclusive black finish with a metallic lustre which is unaffected by heat or moisture. All of these features are exclusively "Solar."

Do not equip your car or specify equipment to the maker until you have seen all of the Solar advantages. See Solars at any live dealer's or write for the catalog.

Solars are made in all styles for oil, electricity, gas and in combinations.

Solar Lamps

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1896 — 1912

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KNIGHT-DAVIDSON COMPANY, Boston, Mass.

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THE CENTURY

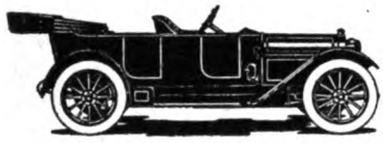
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Volkmar Auto Starter

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Convenient **Economical**

A SPRING starter of Simple Perfection, ABSOLUTELY AUTOMATIC action and FULLY GUARANTEED.

Live Agents Wanted.

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We could build them cheaper
But We Won't.
We would build them better
But We Can't.

THE DIAMOND RUBBER CO.
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Perfected Magneto

Unaffected by oil, water or dust, and with no moving wires to get out of order, its simplicity and strength are unequalled.

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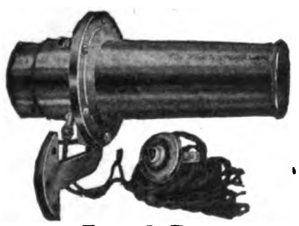
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Torpedo Type

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4 Cylinder 35 H. P. $4500; 6 Cylinder 50 H. P. $5500

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THE COLONIAL

Big, roomy, 5-passenger, open or enclosed car of distinctive design and luxurious appointments. Equipped with self-starting device. It's the car with a thousand little conveniences—

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Electrically Self Started and Lighted

Six Models 40 & 50 H.P. Fully Equipped

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ANYONE who will take the time to investigate the merits of the $1550 "Glide" and compare it with cars costing $1000 more and over, can prove for himself why the "Glide" is best. Send for handsome book and learn of the

5 to 7 Years' Service

—read of the mechanical perfections, the comfort features, appearance, style and guarantee back of the "Glide"—and you will become a "Glide" owner, also. Dealers write for select territory now open. Get FREE book and ask for our proposition. Write today.

THE BARTHOLOMEW COMPANY, 220 Glide Street, PEORIA, ILL.

Empire Twenty-Five

The Little Aristocrat

This is the Big Brother of the Famous Empire Roadster and is a small edition of $5,000.00 cars.

Hence the price of $850 puts this car in a class by itself. Specifications prove the Empire 25 to be the most "Aristocratic" little touring car in America. Write for details today.

THE EMPIRE AUTOMOBILE CO.

224 Massachusetts Street Indianapolis, U. S. A.

Motor Car Manufacturers Since

1893

HAYNES

1912

Occupying the newest and most modern automobile manufacturing plant in America.

HAYNES AUTOMOBILE COMPANY, Dept. T-8 Kokomo, Ind.

Abbott-Detroit 1912 MODELS

MODEL "44"

Seven Passenger, Fore-door Touring Car, fully equipped, less top, windshield and extra seats	$1800
Fore-door Demi-Tonneau, fully equipped, less top and windshield	1775
Fore-door Limousine, fully equipped	3000

MODEL "30"

Fore-door Touring Car, fully equipped, less top and windshield	$1350
Fore-door Roadster, fully equipped, less top and windshield	1275
Colonial Coupe, fully equipped	2150

ABBOTT MOTOR COMPANY

607 Waterloo Street Detroit, Michigan

SHAWMUT TIRES

SOLD EVERYWHERE SHAWMUT TIRE CO., Boston, Mass.

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He Who Gives Most Will Get Most

That's the sole reason why No-Rim-Cut tires outsell all other tires.

That's why the sales have trebled in the past 12 months.

That's why these tires are used today on some 200,000 cars.

Just because we gave so much that average tire bills have been cut in two. And men have found it out.

The Tire That Became the King

This is the tire which stands today as Tiredom's undisputed king.

A tire which is now in its 13th year. But ten of those years were spent in silent obscurity, while the tire was being perfected.

Then suddenly this new type became the sensation. Users told others about it, and the others told others. The fame of this tire spread like wildfire.

In the past two years the demand for this tire has increased by 500 per cent.

Now 1,100,000 have gone into use. Now, with a capacity of 3,800 tires daily, we run night and day, with three shifts of men, to keep anywhere near up with the calls for this tire.

Reason No. 1
Finality in Tires

One reason lies in the perfect construction.

We built a testing machine, where four tires at a time are constantly worn out under all road conditions.

There we tested some 200 fabrics, some 40 formulas for treads. There we compared every method and material, and compared rival tires with our own.

There, by metered mileage, we proved beyond question how best to build a tire. By ceaseless selection we brought them close to finality.

Reason No. 2
Rim-Cutting Ended

Then we invented this way to end rim-cutting.

We made a tire which doesn't hook to the rim flanges. So your removable flanges can be set to curve outward, not inward as with old-type tires.

The tire when wholly or partly deflated rests on a rounded edge, and rim-cutting is made impossible.

We did this by making an unstretchable tire base—by vulcanizing into the tire base six flat bands of 126 braided wires.

And this method—controlled by our patents—forms the only practical way to make a tire of this type.

Statistics show that avoidance of rim-cutting saves 23 per cent of the ruin to tires.

Reason No. 3
10% Oversize

Then we made these tires—No-Rim-Cut tires—10 per cent over the rated size, to save the blow-outs due to overloading.

That means 10 per cent more air—10 per cent added carrying capacity. And that, with the average car, adds 25 per cent to the tire mileage.

No-Rim-Cut and oversize, for armies of motorists, have cut tire bills right in two.

Reason No. 4
8½% Profit

Our multiplied sales, plus our modern equipment, gradually cut the cost of production. Then we pared our profits down to the minimum, to give you the utmost one could give for the money.

Last year our profit on No-Rim-Cut tires averaged 8½ per cent. Below that, in tire making, no maker can go.

For all these reasons, 200,000 motorists have come to No-Rim-Cut tires. And you will join them when you know the facts.

Our 1912 Tire Book—based on 13 years of tire making—is filled with facts you should know. Ask us to mail it to you.

GOODYEAR
AKRON, OHIO
No-Rim-Cut Tires
With or Without Non-Skid Treads

THE GOODYEAR TIRE & RUBBER COMPANY, Akron, Ohio

Branches and Agencies in 103 Principal Cities

We Make All Kinds of Rubber Tires, Tire Accessories and Repair Outfits.

(655) **More Service Stations Than Any Other Tire.**

Main Canadian Office, Toronto, Ont.—Canadian Factory, Bowmanville, Ont.

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Jones Speedometer



Is the Standard of the World. Winner of the Gold Medal. Proven accurate by the leading Universities. Constructed on the principle of Centrifical Force.

THE JONES SPEEDOMETER
Factory: New Rochelle, N. Y.

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San Francisco, 544 Van Ness Ave.
Buffalo, 852 Main St.
Los Angeles, 1229 S. Olive St.
Portland, 329 Ankeny St.
Seattle, 917 East Pike St.
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Any Kind Every Kind Stock, or to Blue Print **Rims** Clincher Q. D. Demountable Channels

For Automobiles, Motor Trucks, Aeroplanes, Motorcycles, Bicycles.

We Also Make Axles and Hubs.

MOTT WHEEL WORKS, Utica, N. Y.
R. B. ABBOTT SALES CO., Sales Agents, Detroit

"Firestone" Tires and Rims

are the least likely to require changing, and afford the best means of tire changing when required.

The Firestone Tire & Rubber Co., Akron, Ohio
and All Principal Cities

Standard Universal Rims



fit any style or make of tires. The side rings are reversible, they curve outward on one side to fit a straight side tire, inward on the other to accommodate a clincher. Two turns of a nut unlocks the rim for demounting, two more turns locks the rim in place. Write for catalog 607, which explains fully.



THE UNITED RIM COMPANY, Akron, Ohio

"RAJAH" SPARK PLUGS

Ignition Absolutely Sure

RAJAH AUTO SUPPLY COMPANY
BLOOMFIELD, N. J.

Raybestos REG. U.S. PAT. OFF.

LOOK FOR THE TRADE-MARK

Every foot of RAYBESTOS is stamped with our trade-mark. This protects you and your car. Be sure your brakes are lined with

TRADE MARK Raybestos REG. U.S. PAT. OFF.

It has the highest coefficient of friction. Made of asbestos, woven with copper wire. Heat-proof, oil-proof, gasolene-proof, and as for water—it has absolutely no effect on this lining.

THE ROYAL EQUIPMENT COMPANY
436 Housatonic Ave. BRIDGEPORT, CONN.
Manufacturers of Duplex and Raymond Brakes and Gyrex—The Mixer.

If you are interested in

FEDDERS RADIATORS

we would like to send our latest catalogue.

Fedders Manufacturing Works
57-67 Tonawanda St. BUFFALO, N. Y.

Repair Parts For MORA Transmissions

We have in stock all parts for the transmissions of MORA automobiles. Write us for prices on any parts you may require and save money over having them made up special.

The NEW PROCESS N.P.R.H. RAW HIDE CO.
OFFICE & WORKS SYRACUSE, N.Y.
REG. U.S. PAT. OFF.

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THE MOTOR WORLD

A Trade Paper Giving the World's Motor News

Vol. XXXII
No. 2

New York, July 4, 1912

Ten cents a copy
Two dollars a year



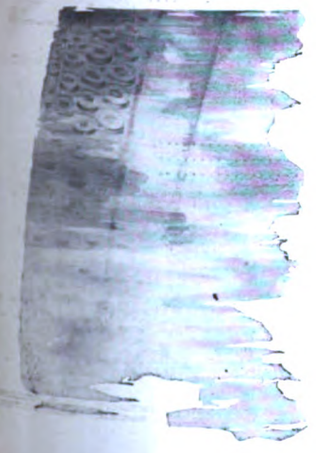


WE have made a profound impression with our widely advertised and exceptional guarantees on these tires.

Because our guarantees are just the kind to appeal to the motorist who has had the average sort of experience with tire service costs and adjustments.

If you could sit here at headquarters and watch the demand grow you would hesitate not a day in stocking

PENNSYLVANIA VACUUM CUP TIRES



With each casing goes a printed definite guarantee of 4000 miles actual service, stipulating the fairest terms your customer could desire.

The additional guarantee that a car equipped with Vacuum Cup Tires will not skid on wet or greasy pavements or the tires may be returned at full purchase price, is also a powerful incentive.

In short, there's too strong and definite a demand for Vacuum Cups for any live dealer to let it go by him.

The thing to do is stock them, and the time to stock them NOW.

PENNSYLVANIA RUBBER COMPANY, Jeannette, Pa.
Reorganized February 1, 1910

Pittsburgh, 505 Liberty Ave.
Minneapolis, 34 South Eighth St.
Detroit, 254 Jefferson Ave.
Kansas City, Mo., 514 East 15th St.
Chicago, 1004 Michigan Ave.
Cleveland, O., 1837 Euclid Ave.

PENNSYLVANIA RUBBER CO. OF NEW YORK
New York City, 1700 Broadway

PENNSYLVANIA RUBBER CO. OF CALIFORNIA
San Francisco, 512-514 Mission St.
Los Angeles, 930 South Main St.

An Independent Company with an Independent Selling Policy

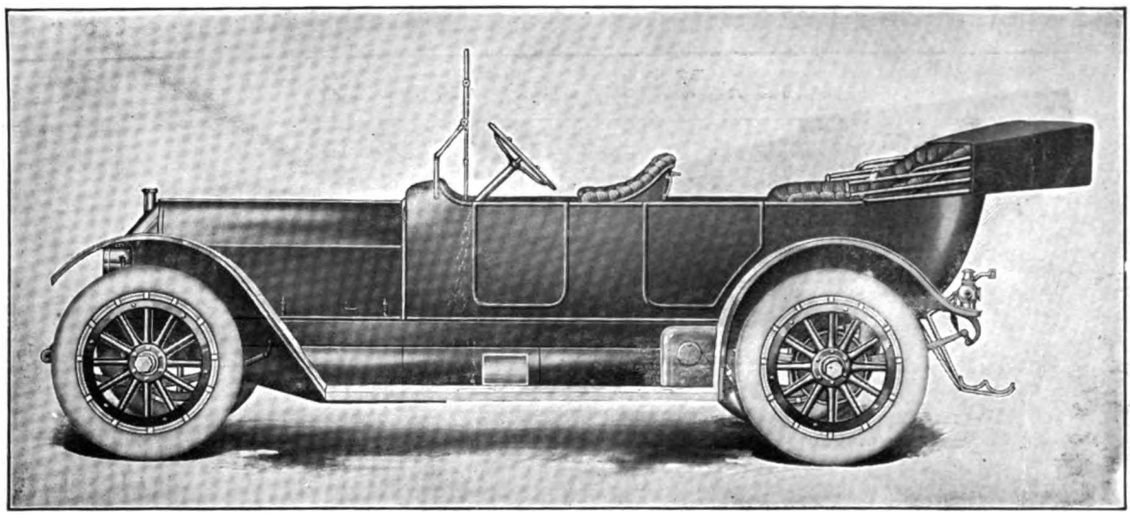
Published Weekly by The Motor World Publishing Company, 1600 Broadway, New York

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ANNOUNCEMENT

1913 Pleasure Models

"If you have never driven one up a hill,
You have missed half the sport of motoring!"



A Knox Little Six—Model 46

A new distinctive car of unusual power, quietness, comfort and style, embodying the most advanced American and European ideas in approved design and construction. Among the important features of Model 46 are the V-shaped radiator, silent chain driven cam and magneto shafts, option on right or lefthand steer and unusual provision for taking up wear and preventing noise. **"The Car of Surprising Economy."**

Motor 6-cylinder, 4⅜" x 5½". A. L. A. M. Rating 46 H. P.
Wheel-base 130". Tires 37" x 5".

Price with all Open Type Bodies and Complete Equipment.....$4350
Price with Limousine Type Bodies and Complete Equipment..... 5350
Price with Landaulet Type Bodies and Complete Equipment..... 5400

60 H. P. Six—Model 66

An ideal, powerful, spacious family car, incorporating the famous Knox 6-cylinder motor in its fourth year of refinement without radical change.

Motor 6-cylinder, 5" x 5½". A. L. A. M. Rating 60 H. P.
Wheel-base 134". Tires 38" x 5½".

Price with all Open Type Bodies and Complete Equipment.....$5000
Price with Limousine Type Bodies and Complete Equipment..... 6200

4-Cylinder—Model 44

The lightest Knox model. Trim, comfortable, a powerful hill climber, quiet and flexible, embodying the famous Knox motor in its fifth year of service without important change.

Motor 4-cylinder, 5" x 5½". A. L. A. M. Rating 40 H. P.
Wheel-base 117" and 122". Tires 36" x 4½".

PRICES, COMPLETELY EQUIPPED

2-Passenger Raceabout	**$3300**	**7-Passenger Touring Car**	**$3550**
Double Rumble Raceabout	**3350**	**5-Passenger Touring Car**	**3500**
4-Passenger Torpedo	**3400**	**2-Passenger Coupe**	**4300**
5-Passenger Torpedo	**3450**	**Limousine**	**4400**

4-Cylinder—Model 45

Longer body and wheel-base than Model 44. A roomy, comfortable family car. An ideal chassis for spacious, open and closed types of bodies.

Motor 4-cylinder, 5" x 5½". A. L. A. M. Rating 40 H. P.
Wheel-base 126". Tires 37" x 5".

Price with 6-Passenger Open Bodies and Complete Equipment.....$3700
Price with 7-Passenger Open Bodies and Complete Equipment..... 3800
Price with Limousine Bodies and Complete Equipment..... 4700

Knox 4-cylinder models are completely equipped, including electric side and tail-lamps with storage battery, acetylene starters and automatic gas lighters for headlights.

Knox 6-cylinder models are regularly equipped with self-starters and dynamo lighting systems.

Send for Folder with Detailed Specifications.

KNOX AUTOMOBILE COMPANY, Springfield, Mass.

New York — BRANCHES — Chicago

"A Demonstration is Irresistible"

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The First HENDERSON Birthday Car Was "Hartford Equipped"

CABLE ADDRESS "HENDERSON"

HENDERSON MOTOR CAR CO.
INDIANAPOLIS, U.S.A.

May 29, 1912.

Hartford Auto Parts Co.,
Hartford, Conn.

Attention of Mr. D. F. Kalish.

My dear Mr. Kalish:

I wish to thank you for your prompt attention in getting this material out for us. As you will see by the trade papers, it was vitally essential that we have these parts out, because today, the 29th of May, is what may be called the Henderson "Birthday", inasmuch as our first car was placed on exhibition in the Claypool Hotel lobby, and I am pleased to say, it contains a Hartford clutch. I trust that the rest of the clutches will be as satisfactory as the one we now have.

Yours very truly,
THE HENDERSON MOTOR CAR CO.

Charles S. Rieker
Chief Engineer.

Almost unnecessary to state that the balance of the Henderson output will carry Hartford clutches.

J. S. BRETZ CO., New York, Detroit, Sole Selling Agents.

CONE CLUTCHES

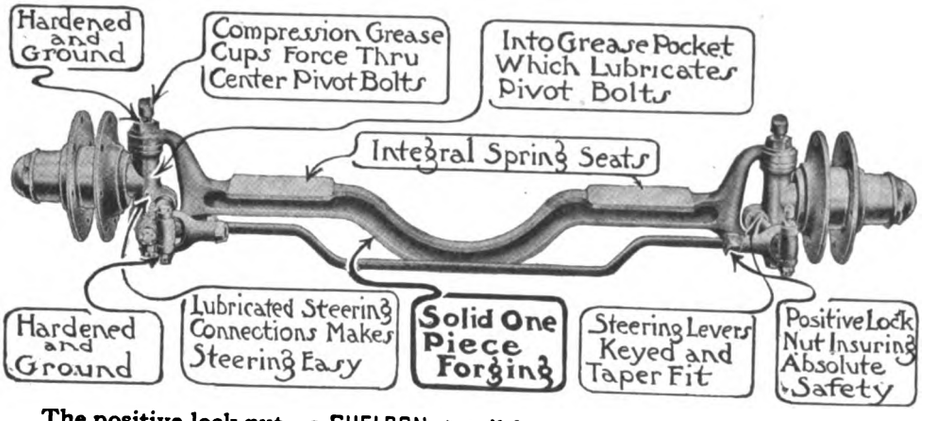
HARTFORD AUTO PARTS CO.
HARTFORD, CONN.

UNIVERSAL JOINTS

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EXPERIENCE – SHELDON – RIGHT DESIGN
FACILITIES – AXLES – RIGHT STEEL
"Made in the Largest Axle Factory in the World"

Axle Talk—No. IX



The positive lock nut—a SHELDON detail feature—is a large factor in safety. Especial attention is called to it just to emphasize the attention paid here to minor construction details, which in the aggregate means all round strength —and in axle strength lies safety.

SHELDON Axles have grown out of the crucible of experience into a science based on precise knowledge.

In the making, a physical laboratory, a chemical laboratory, an engineering staff of more than ordinary size and worth, a plant of unrivaled magnitude, all work along pre-determined lines.

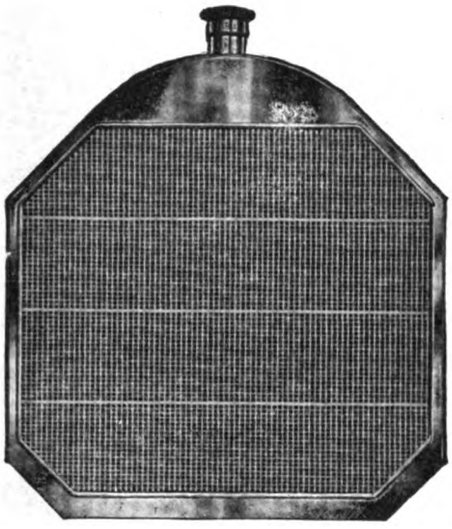
SHELDON Axles are resultant products—not haphazard "may-be-goods" but by test and comparison "The Best in The World."

SHELDON AXLE COMPANY, Wilkes-Barre, Pa.

CHICAGO OFFICE
68 East 12th St.

DETROIT OFFICE
1215 Woodward Ave.

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The Mayo—the radiator thoroughbred

A MAYO RADIATOR

on any car is insurance of trouble freedom so far as this part is concerned.

¶ If these radiators had ever developed weak points we would know it for we have been building them long enough to "get the answer."

¶ We have proved, by the large and ever growing demand, that these radiators present a maximum of cooling surface, through correct design, and strength that even defies rough treatment, through right materials and construction.

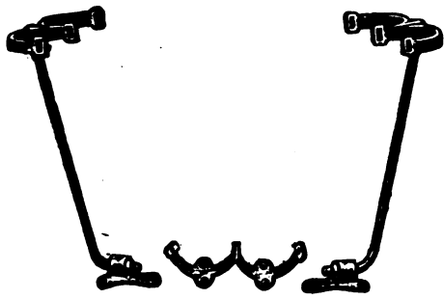
¶ Insist on Mayo Radiators.

Mayo Radiator Company
NEW HAVEN, CONNECTICUT

The Largest Automobile Snpply House in America

FIFTEEN STORES IN THE UNITED STATES

"Torpedo" Tire and Demountable Rim Holders



Designed especially for use on Torpedo body or Fore-door cars. Set consists of two strong arms firmly bolted to running board and permitting of sufficient adjustment to accommodate two tires or demountable rims, of standard sizes, 4 inch or smaller. Made of solid Brass and guaranteed to give perfect satisfaction.

Finish: Furnished in Hard Rubber Black Enamel finish, and full Polished Brass.

	Brass	Black
Price, complete with Straps...	$4.00	$3.00

A dozen other styles and sizes in stock. See catalog.

Our 1912 Catalog, which is held as a book of reference by manufacturers, dealers and automobile owners, will be mailed on request. Circulation limited to 100,000 copies.

Chas. E. Miller

MANUFACTURER, JOBBER, EXPORTER AND IMPORTER

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The M&P 1000 lb. Truck sells for $1500

WE ARE the pioneers in the production of a high-grade electric truck that will successfully compete with others of its type that sell as high as $2200.

This will be welcome news to that great body of merchants who have, heretofore, been forced to be content with a gasoline truck selling at, or about, the same figure, for until we made this radical advance, the electric truck was beyond the means of the average dealer in merchandise.

That the M & P Electric Truck for $1500 is low priced does not presuppose any lack of quality in workmanship, construction or material.

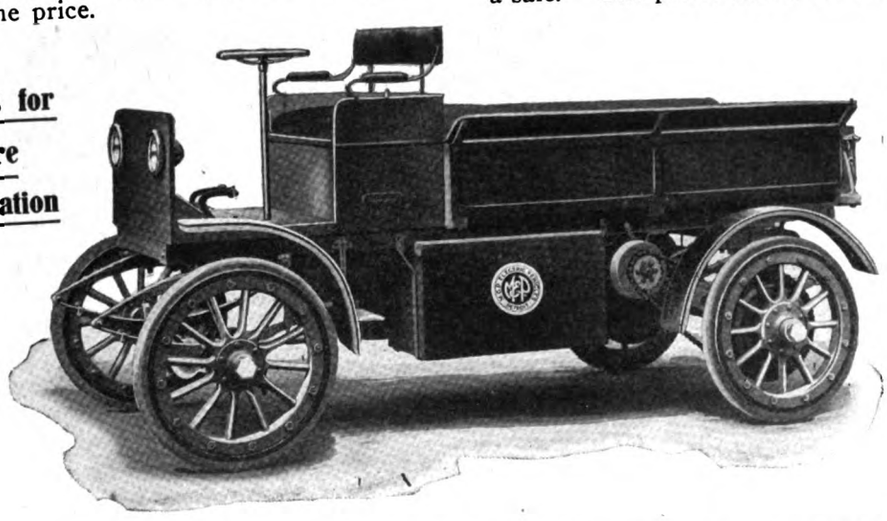
We positively guarantee this truck to be standard in every detail, sturdily built, capable of withstanding more abuse and rough treatment than any gasoline truck at twice the price.

We claim for it long life, better service, cheaper cost of operation than that comprehended by a gasoline truck of twice the price.

The M & P Electric was built before the selling price was decided on. We first made a truck as good as we could and then placed the price within reason, preferring quantity sales and small profits rather than limited sales and unwarranted profit.

We want to get dealers interested in this proposition. It is ideal in every particular. The truck has already proved itself and its popularity indicates small sales resistance. A demonstration usually means a sale. The prices are as follows:

Ask us for more information



Chassis $1450

Express Body $1500

Enclosed Body $1600

THE M & P ELECTRIC VEHICLE COMPANY

Franklin and Dubois Streets **Detroit, Michigan**

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"The Horn that's Made for the Discriminating"

TUTO HORN

THE TWO TONE HORN

Automatic in Operation.

CONSIDER the service value of all the warning signal devices now on the market.

¶ What can you do in a case of emergency?

¶ To begin with, the low note horn is absolutely necessary as partial equipment on every motor car, for 90% of the warning signal notes need not be extremely loud to get the right-of-way. That is why the inefficient bulb horn is retained by car owners and manufacturers who have adopted the inflexible-loud-note horn for emergency purposes.

¶ This is a duplication of warning signal mechanisms and of operating means—a bulb and a button, separated and requiring an extended movement of the hand to go from the one to the other.

¶ If the bulb is used for ordinary signalling, its inadequate note makes it necessary to go to the louder signal, and when at close range.

¶ The bulb and button being separated, require a movement of the hand and the concentration of thought, right at a critical moment, when life, limb or property is in danger.

¶ Thus, the supplementing of one inadequate signal with another one-purpose emergency signal, is now acknowledged the most inefficient and ineffective combination.

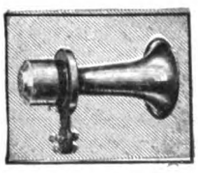
¶ All of these signalling troubles are overcome by the TUTO Horn, which does all of the signalling of the car by producing a low abrupt service signal for use in place of the bulb horn, and a loud signal for emergencies or where the milder note proves ineffective. The going from the low note to the loud note is done by merely increasing the pressure on the one button—a simple, rapid and safe operation which does not require extended movement of the hand.

¶ This increased pressure on the TUTO push button is unconsciously obtained by the gripping of the steering wheel at the approach of danger (button already partially depressed for the low note), then going clear down so as to get the loud emergency signal.

¶ There is no hesitancy, no chance for confusion and the car is kept in full control at all times.

¶ This automatic action is not obtainable in any other warning device (patented) and is worth many times the price of the TUTO Horn.

¶ Do not fail to specify the TUTO if you desire the best in warning signal service.

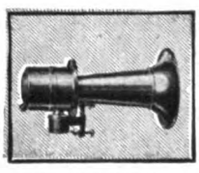


TUTO Horn, $25.00

The Dean Electric Co.

260 Taylor Avenue, Elyria, Ohio

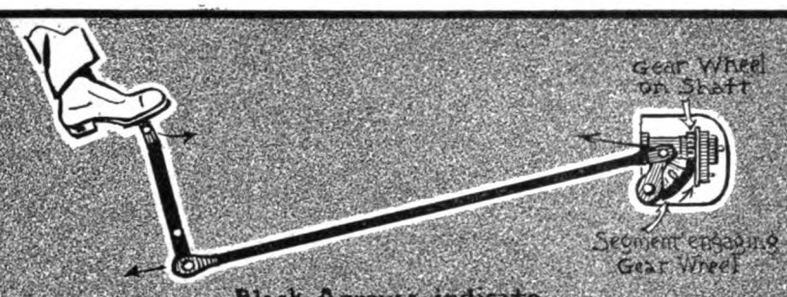
"Look for Dean where Quality's seen"



TUTO-ETTE $17.50

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THE NATIONAL STARTER



NO Gas Air Electricity or Springs — BUT A Resistance Reducing Application of Simple Mechanical Principles — It Cannot Fail You —

It is but logical and right that starting the engine should be a mechanical operation—just as braking, using the clutch or changing speed is mechanical.

Gas, electricity or compressed air are never used in these operations—they're all too uncertain.

The National Starter is just as efficient and simple as the brake installation and it cannot fail under any condition.

The illustration tells the story.

This starter is not an experiment being tried out in a "half baked" state on credulous car owners.

We have subjected it to tests covering a long period of time and we guarantee it to—

Outlast any car on which it is installed.

Operate one thousand times out of one thousand.

Stand rough treatment and abuse.

Now, Mr. Dealer, if you are handling one or more of the many complicated self starting devices that depend upon valves, tubes, springs, wires, pumps, magnetos, gas tanks, etc., then consider this rational, purely mechanical starter.

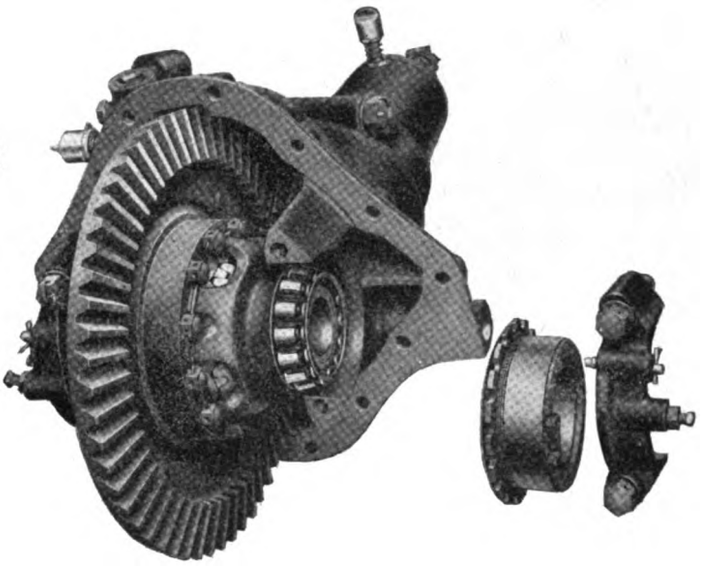
It is the coming solution to the self cranking problem —in fact, it's not coming—it's here.

There is still plenty of unoccupied territory—write and get your share of it, but do it to-day.

NATIONAL GAS ENGINE STARTER COMPANY

30-32 North Dearborn Street **Chicago, Illinois**

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Power Transmitting Unit
Timken-Detroit Rear Axle

The Gear with the Polished Teeth

On the manager's desk lay a gear with teeth that shone like silver. 'Twas the first thing that caught the motor car engineer's eye when he called at the Timken-Detroit plant. The first question that he asked concerned the gear with the polished teeth.

TIMKEN-DETROIT GEAR-GRINDING PROCESS

It was explained to this engineer for one of the highest grade cars that Timken-Detroit gears are ground by a Timken-patented process which corrects all the microscopic inequalities left by even the finest gear cutters.

He was taken out into the factory and shown the special Timken-built machines at work. He saw at a glance that the theory of perfect master gear and master pinion controlling the gears to be ground was sound.

Next day he brought the production manager of his plant to see the wonderfully simple and efficient machines.

The Proof Demanded

The process looked right, but they asked for proof of results.

"Send us," we said, "some of your gears that have failed to pass your inspection. Mark them secretly and, after they're ground and returned, mix them with others and send them through your testing department again."

This was done. Ten gears that had failed to pass were sent us to grind. They were put through the Timken-Detroit gear grinding process and returned.

Every one of those gears passed inspection.

The inspector was asked to pick out the ten best gears in the lot. He picked out the ten that we ground.

The Result

Today the driving and pinion gears in each of their cars are ground by the Timken-Detroit process.

The Company has gained because the process corrects faults that formerly scrapped many gears.

The car owners have gained because all the gears are now perfect. Friction has been reduced and noise practically eliminated.

Applied to Timken-Detroit Axles

Every gear in the Timken-Detroit Axle is ground by this special process.

Timken-Detroit Axles are the only axles equipped with gears ground by a process that produces the results which so thoroughly convinced this engineer and this production manager. (Names will be given on application.)

There are many other true stories of superiority in Timken-Detroit manufacture—tales as interesting and important as the story of the Gear with the Polished Teeth.

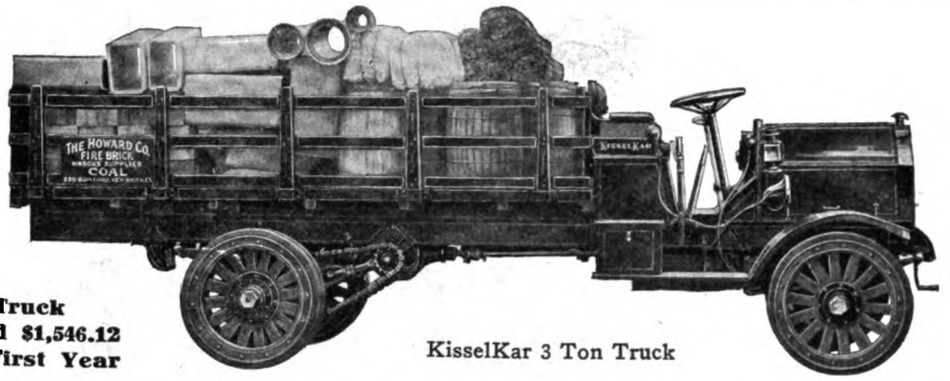
The Timken-Detroit Axle Company

Detroit, Michigan, U. S. A.

The only axle manufacturer licensed to make axles equipped with the famous Timken Roller Bearings

14

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This Truck Saved $1,546.12 the First Year

KisselKar 3 Ton Truck

Saved $1,546.12 First Year

THE purchase price of this four-ton truck, owned and operated by the Howard Company, of New Haven, Conn., plus interest, depreciation, overhauling, fuel and driver's salary for one year, amounted to $5,921.88.

It replaced three double trucking teams. The cost of the horses, wagons and harnesses, plus interest, maintenance and drivers' salaries for one year amounted to $7,468.00 A balance in favor of the truck of $1,546.12—the first year.

A Kissel truck is your logical selection because it is the truck of surest economy and slowest depreciation. It is strong, simple and silent. It carries 50 per cent. overload without harm. It rides easiest. It consumes the least fuel.

Note these striking KisselKar merits: its wonderful engine—its lock on the differential which equalizes power between rear wheels, when, without it, a slipping wheel would absorb all the power—its fourth geared up speed which saves the engine when driving empty and makes fast time judicious when haste is necessary.

At the disposal of KisselKar owners is the unrivaled KisselKar service, consisting of completely equipped service buildings at leading centers, where the mechanical end of motor trucks is taken off your hands.

KISSELKAR TRUCKS

1½ to 2, 3, 4, 5 Ton Trucks, Delivery Wagons, Etc.

Write and tell us how many horses you use, how many trips they make per day, single or in teams, the average number of stops per load, carrying capacity of your equipment, average daily distance covered, cost of drivers and aids, general nature of the highways traveled.

Do this and we will tell you how motor haulage may be most advantageously used in your business.

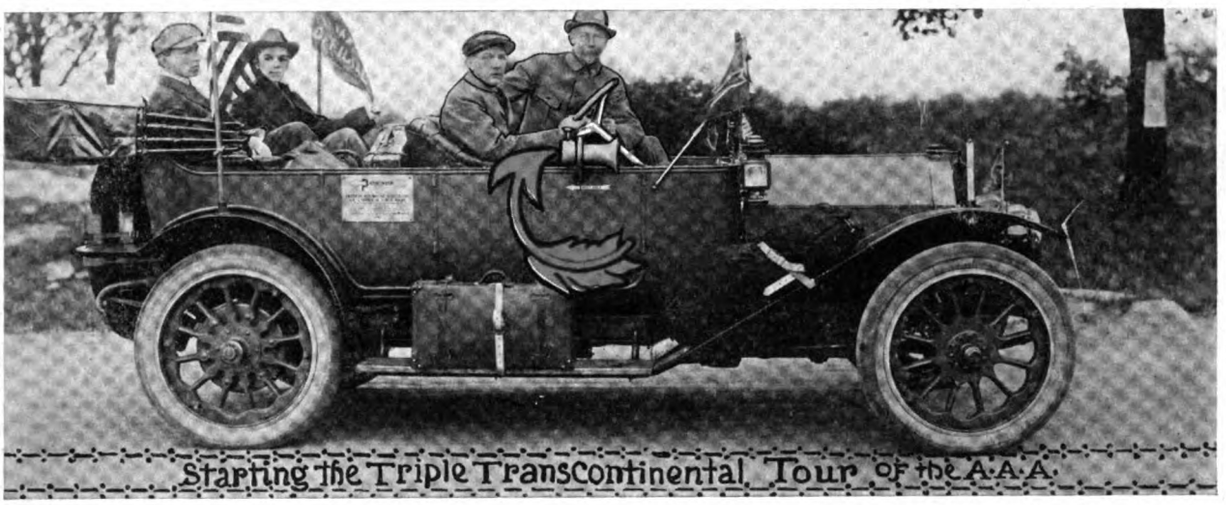
Your copy of the new catalog is ready. Send for it.

Kissel Motor Car Co., 159 Kissel Ave., Hartford, Wis.

Boston New York Chicago Milwaukee Kansas City Los Angeles
Minneapolis St. Paul St. Louis Dallas

Philadelphia, Cleveland, Detroit, El Paso, San Antonio, New Orleans, Baltimore, Omaha, Butte, Denver, San Francisco, Seattle, Portland, Duluth, Buffalo, Pittsburgh, Hartford, Conn., New Haven, Albany, Troy, Montreal, Quebec, Toronto, Winnipeg, and 200 other principal points throughout America.

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Starting the Triple Transcontinental Tour of the A.A.A.

A. L. Westgard, official Pathfinder and Pilot of the American Automobile Association, has equipped the triple transcontinental car with

THE LONG HORN

The reasons for using the Long Horn on this important official trip may be summed up very briefly in the following statement of facts.

Because the Long Horn never fails to work. If you can push the button the Long Horn will respond with a warning note. There are no parts to give out. No wires to break. No friction pulley to slip. No bulb to rot or crack. No motor to fail to work. No cost of upkeep.

The Long Horn is a perfect and positive mechanically operated gear driven horn that can never fail to issue its warning note.

The gear driven mechanism depends only on the pressure of hand and elbow for its source of power.

There is no transmission of power from engine or from a battery or generator nor is there any delicate mechanism to get out of order.

And there is no maintenance expense.

Dealers will find the Long Horn a ready seller.

The fact that Mr. Westgard is using the Long Horn is an argument in favor of its sale.

Write today for unoccupied territory.

THE G. PIEL COMPANY

13th Street and Boulevard
LONG ISLAND CITY

PHILADELPHIA, PA., 1416 Vine Street
BOSTON, MASS., 109 Massachusetts Avenue
MINNEAPOLIS, MINN., 70 So. 10th Street
BUFFALO, N. Y., 852 Main Street
SAN FRANCISCO, CAL., 544 Van Ness Avenue
LOS ANGELES, CAL., 1229 So. Olive Street
SEATTLE, WASH., 917 E. Pike Street
PORTLAND, ORE., 329 Ankeny Street
DENVER, COL., 15th and Curtis Streets

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Some One Always Leads the Procession.

IN AUTOMOBILE TIRES,

THE DAHL PUNCTURELESS TIRE LEADS

The **DAHL PUNCTURELESS** is no new sensation: it has been on the market for three years. It has been tried out and has been found to be "entirely satisfactory" by thousands of users. It tells its own story and this is the story it tells.

A soft, resilient, rubber-like product, moulded into shape to fit your casings and, when compressed in the casings, makes a very resilient cushion filler that replaces the inner tube. Your car, when equipped with the **DAHL PUNCTURELESS,** rides like air but has none of the disagreeable disadvantages of the air tire.

No blow-outs, no punctures, no worry, no waste of time by the roadside, no flat tires, no accidents caused by punctures or blow-outs.

With the **DAHL PUNCTURELESS,** when you start on your journey, you have that feeling of safety and freedom from worry that you never can have when riding on air tubes.

If you have ever noticed you will have observed that your casings are seldom discarded because worn out: they are generally thrown away when about half worn out because they are blown and cannot be repaired.

DAHL PUNCTURELESS saves its cost to you in a very short time by the extra mileage you get on your casings. They do not blow out with the **DAHL PUNCTURELESS** and you do not have to replace them as you do the blown-out tires.

Beware of Imitations

There is no other product on the market like the **DAHL PUNCTURELESS.** Don't allow yourself to be misled or fooled by any fancy advertisements of other fillers, imitations of the **DAHL PUNCTURELESS.**

INVESTIGATE; your investigation will disclose that no other product in the world can begin to touch the **DAHL PUNCTURELESS.**

The general public has set the seal of approval on the **DAHL PUNCTURELESS;** wise old party is Old General Public; when his approval has been secured it is a sufficient recommend . .

The **DAHL PUNCTURELESS** made its first appearance three years ago and our sales have greatly increased each year. Today we cannot supply our demand. We put our money into the quality of our goods. No need for us to spread our money on billboards and in printer's ink: the quality is what talks; our customers all like the **DAHL PUNCTURELESS** and want more of them and recommend them to their friends. MERIT WINS every time and that is why **DAHL PUNCTURELESS** wins. The **DAHL PUNCTURELESS FILLER** has come to stay.

Manufacturers, Take Notice

If your cars are not built to be equipped with some first class filler product like the **DAHL PUNCTURELESS,** you have got to build them right. Any well built car will carry **DAHL PUNCTURELESS** equally as good or better than it will carry air; and any car that will not carry **DAHL PUNCTURELESS** is not a well built car.

Customers, Take Notice

If any manufacturer tells you not to equip your car with **DAHL PUNCTURELESS,** do not buy his car, because if you do you will get a bunch of junk instead of a car. You want an automobile.

The **DAHL PUNCTURELESS** is represented in all large cities in the United States. If you want full information, write to or call on any of the following representatives.

ALABAMA—H. W. Roloson, 512 So. 20th St., Birmingham, Ala.
CALIFORNIA—Puncturelesss Tire Co., 441 Golden Gate Ave., San Francisco.
CONNECTICUT—Howard A. Potter, 10 Jefferson St., Hartford, Conn.
DELAWARE—Dahl Puncturelesss Tire Co., 1309 Race St., Philadelphia, Pa.
ILLINOIS—Puncturelesss Tire Co., 1323 Michigan Ave., Chicago, Ill.
IOWA—Puncturelesss Tire Co., Calmer, Iowa.
KANSAS—C. C. Davis, 106 E. 10th St., Topeka, Kan.
KENTUCKY—John S. Hobson, 432 E. Broadway, Louisville, Ky.
MASSACHUSETTS—Tire Core Co. of America, Boston, Mass.
MARYLAND—Dahl Puncturelesss Tire Co. of Delaware, Philadelphia.
MICHIGAN—Puncturelesss Tire Co., 1193 Woodward Ave., Detroit.
MISSOURI—Puncturelesss Tire Co., 527 Vandevender Ave., St. Louis.
MISSOURI—Puncturelesss Tire Co., 1730 Grand Ave., Kansas City.
NEW YORK—Tire Core Co. of America, 246 W. 59th St., New York City.
OHIO—Ohio Puncturelesss Tire Co., 242 No. 4th St., Columbus, O.
PENNSYLVANIA—Dahl Puncturelesss Tire Co. of Delaware, Philadelphia, Pa.
RHODE ISLAND—Tire Core Co. of America, Providence, R. I.
SOUTH DAKOTA—I. L. Aaker, Minneapolis, Minn.
TENNESSEE—John S. Hobson, Louisville, Ky.
VIRGINIA—Dahl Puncturelesss Tire Co. of Delaware, Philadelphia.
WEST VIRGINIA—Dahl Puncturelesss Tire Co. of Delaware, Philadelphia, Pa.

For Agency and Selling Rights Generally, address the Home Office at Minneapolis, Minnesota. We have some good territory yet to be opened, and we want first class business men of high standing to take hold of a selling contract for entire States. We want only men of ability and high business qualifications with means enough to handle their territory efficiently. The **DAHL PUNCTURELESS** Tire filler is the remedy that you have been looking for to solve the tire trouble problem. Try it and be satisfied. "Everybody's doing it."

DAHL PUNCTURELESS TIRE COMPANY, 501 1st Ave., N.E., Minneapolis, Minn.

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1/4 MILLION

EXHAUST TUBES IN TWELVE MONTHS

We made this enormous quantity because we received orders for them. We received orders for them because we can make them better, cheaper and quicker than any one else.

We make them better because we have the most up-to-date machinery and employ only expert workmen.

We make them cheaper because we make our own tubing and make so many.

We make them quicker because we know how to make them and do not fuss, fret or fume if the job is new or a "sticker."

Our tubes are strong, accurate to dimensions and very light in weight.

It is not foolish to make your own tubes, but it's futile, especially when you can get what you want without wandering.

THE STANDARD WELDING CO.

CLEVELAND, OHIO

NEW YORK **OHIOAGO** **DETROIT**

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The Truth Regarding The Gas Tank Patents

The U. S. Court for the Northern District of Illinois has, on final hearing, re-affirmed its previous decision in the gas tank patent case.

The case will now be appealed to the U. S. Circuit Court of Appeals, 7th District, and a decision which will settle the controversy is expected in the fall.

Until a final decision is reached, the dealer is advised to "sit tight."

Meanwhile, these facts may be of interest:

Have the Gas Tank Patents Expired?

Decided "Yes"

U. S. Court, Northern Dist., Illinois.

Decided "No"

U. S. Circuit Court of Appeals, 6th.
U. S. Court, Eastern Dist., Michigan.
U. S. Court, Indiana.
U. S. Court, Eastern Dist., Missouri.
U. S. Court, Southern Dist., California.
U. S. Court, Western Dist., Washington.
U. C. Court, Colorado.
U. S. Court, Western Dist., Texas.

Can Other Firms Re-fill Prest-O-Lite Tanks?

Decided "Yes"

U. S. Court, Northern Dist., Illinois.

Decided "No"

U. S. Court, Eastern Dist., Wisconsin.
U. S. Court, Western Dist., New York.
U. S. Court, Indiana.
U. S. Court, Northern Dist., Texas.
U. S. Court, Eastern Dist., Michigan.
U. S. Court, Eastern Dist., Missouri.
U. S. Court, Southern Dist., California.
U. S. Court, Western Dist., Washington.
U. S. Court, Colorado.
U. S. Court, Western Dist., Texas.

One Case Already Decided by Higher Court

The decision in the U. S. Court for the Eastern District of Michigan, favoring The Prest-O-Lite Co., has already been affirmed on appeal by the U. S. Circuit Court of Appeals, 6th Circuit.

Appeal in the case just decided at Chicago is being taken to the U. S. Circuit Court of Appeals, 7th Circuit.

We wish merely to emphasize this:

Until this appeal has been decided by the higher courts, the questions involved in the gas tank patent suits are not SETTLED, even as against the defendent in this one case.

The Prest-O-Lite Co., Indianapolis, Ind.

Charging Stations and Branches in All Principal Cities.

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Regardless of the Final Decision on Gas Tank Patents, No Dealer Can Afford to Overlook These Points:

1st—Every concern that has tried to win agents and customers away from Prest-O-Lite has failed to do so, and ALL except those involved in the present law suits have gone out of business.

2nd—In each and every case, where the gas tank maker quit the business, the dealers have "held the sack" on worthless tanks that could not be re-filled.

3rd—Every company, past or present, that has claimed "more gas and better gas than Prest-O-Lite" has failed to make good the claim.

4th—Every company, past or present, that has promised an adequate exchange service to compete with Prest-O-Lite, has fallen down.

5th—Prest-O-Lite is, and will continue to be (no matter how the patent cases finally go)

The ONLY gas tank backed by adequate exchange service.

The ONLY gas tank that motorists and the vast majority of dealers will have anything to do with.

The ONLY gas tank that a dealer can handle without risk of "holding the sack."

The ONLY gas tank that will pay the dealer the profit he has a right to expect.

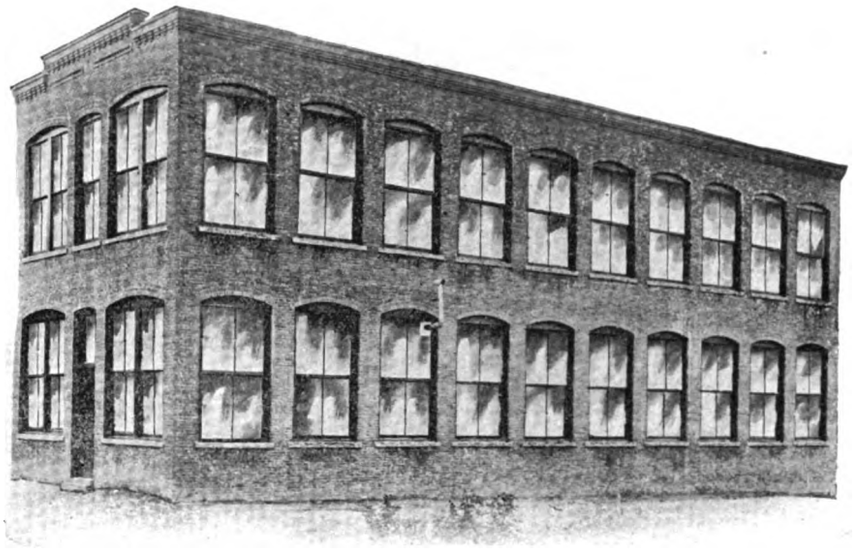
Prest-O-Lite has always MADE money for dealers.
Imitations have always LOST money for dealers.

The Prest-O-Lite Co., Indianapolis, Ind.

Exchange Agencies EVERYWHERE.

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New Departure Engineering Building



METALLURGICAL LABORATORY : CHEMICAL LABORATORY
PHYSICAL LABORATORY : HEAT TREATING LABORATORY
ENGINEERING SERVICE DEPARTMENT

Every inch of the large floor space in this building is devoted to two supremely important purposes:

The perfection of New Departure ball bearings by progressive improvements in materials, manufacturing processes and general efficiency of the product.

A study of the practical problems and interests of users of anti-friction bearings, with a constant aim to assist in selecting just the ball bearing equipment that will give greatest efficiency at minimum cost of installation and maintenance.

We have secured an equipment for each department that is not excelled anywhere, particularly with reference to ball bearing manufacture and consultation service.

Our exceptional facilities are yours for the asking. In other words, the co-operation of our entire engineering department is at your command for the selection of the type and size of ball bearings adapted to your design and work. Write us today.

The New Departure Manufacturing Co.
BRISTOL, CONN.

Western Branch, 1016-17 Ford Bldg., Detroit, Mich.

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Is Your Name Frankenstein?

In Shelley's weird story "Frankenstein" is an inventor who instills life into a monster of his own manufacture. For a time he employed this mechanical creation to his own ends but later the automaton became the *master* — with terrifying results.

Be the *master* when it comes down to equipping your car with a speedometer. Don't accept an inferior one that will cause you everlasting trouble.

You can't go wrong if you insist on the speedometer used on the greatest number. It must be the best.

Speedometers that cost more than the Stewart are priced *high*, not because they are *better*, but only because they are *fewer*. The extra price doesn't represent *value*. It only means a *smaller* output.

The overhead charge borne by each Stewart Speedometer is *one-tenth* as big as that on any other. The divisor is that much larger. The Stewart's on *four* cars out of five. Others charge *more* because they make *less*.

The Stewart Speedometer *can't* be better—it *can't* be bettered.

Magnetic principle — jewel bearings — wearing parts hardened and polished — open dial — large figures, easily read — absolutely accurate; 100,000-mile season odometer — 100-mile trip register, can be reset to any tenth of a mile. Guaranteed for five years. Strongest flexible shaft—drop forged swivel joint—noiseless gears.

"ALWAYS ON THE JOB."



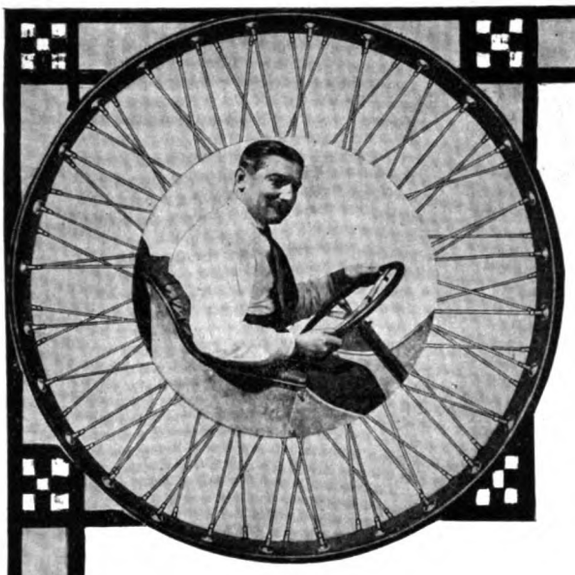
Speedometers, $15 to $30
Clock Combinations, $45 to $70

STEWART & CLARK MANUFACTURING CO.

1928 Diversey Boulevard, Chicago, U. S. A.

Detroit San Francisco New York Los Angeles Chicago Boston Kansas City
Cleveland Philadelphia Minneapolis Indianapolis London Paris

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French "Grand Prix" over famous Dieppe Course won on wire wheels.

Thirty-six cars out of forty-eight starters wire wheel equipped.

Only six of the forty-eight cars used wooden wheels, six others using steel wheels.

Boillot, champion road driver of France, in a Peugeot car, mounted on WIRE WHEELS, won the French Classic over the Dieppe Course last week.

The remarkable preponderance of wire wheels on the cars in this race shows conclusively that there is no longer any question of the future of wire wheels. Out of a field of 48 starters only six cars were equipped with wooden wheels.

Cable reports of the performance of the cars in the race are unanimous in the statement that both De Palma and Bruce Brown, who shifted from wire wheels to wooden wheels the night before the race, lost a great deal of time because of tire trouble.

70% MORE TIRE MILES

WIRE McCUE WHEELS

W. F. Bradley, Motor Age representative in France, says in one part of his story, speaking of Bruce Brown —"But the American soon ran into tire troubles of which Boillot had none."

The Automobile, in speaking of the same race, says: "In Europe at least there can be no doubt of the favor of wire wheels for racing and for ordinary service as well."

The McCue Company is the foremost American manufacturer that is ready to meet the demands for wire wheels in this country.

McCue axles are so constructed as to admit of the use of wire wheels or wooden wheels on the same spindle.

THE McCUE COMPANY, Buffalo, N. Y.



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Billings & Spencer

Improved Steering Connections

Adopted as the Standard by the Leading Automobile Manufacturers

Ready for Immediate Shipment

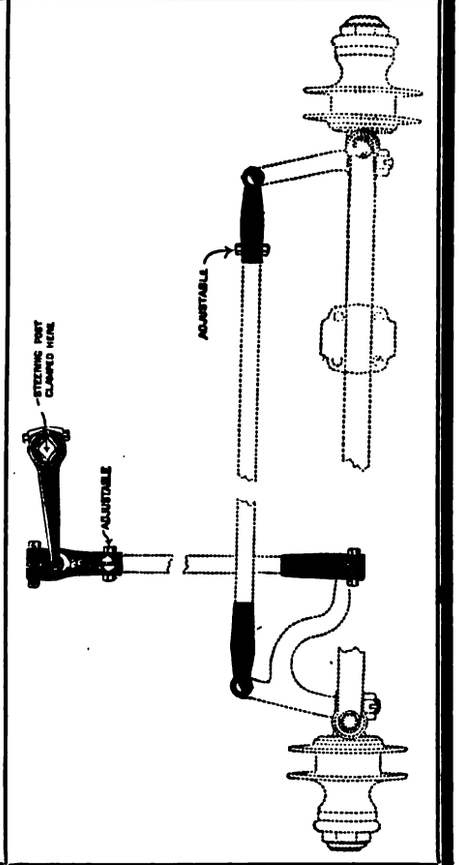
These steering connections are drop-forged of 25 to 30 Carbon O. H. steel.

Always in Stock

Manufacturers of pleasure and commercial vehicles can save both time and expense by taking advantage of this fact.

Blue Prints and Price List Mailed on Request.

The Billings & Spencer Co.
HARTFORD, CONN.



The Niagara Self-Starter



does not soot and foul your spark plugs, because it mixes the acetylene gas with pure air and forces this mixture into the cylinders of your engine.

Acetylene gas alone deposits soot thickly in your cylinders and upon your spark plugs. Avoid using starters which depend upon pure acetylene gas. Use only the Niagara Self Starter which mixes this gas with the proper proportion of pure air.

The compressor of the Niagara Starter, shown here, is made of seamless drawn steel tubing with a cast-iron piston and two cast-iron piston rings.

Self Starters using leather washers are inefficient because the leather washers wear out and rot quickly under the influence of acetylene.

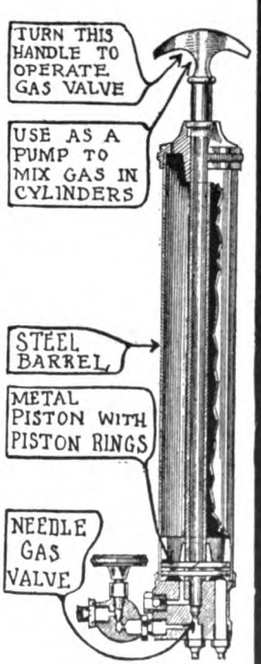
The Niagara Self Starter is unaffected by acetylene gas and will last forever.

The Niagara Self Starter will start your car every time you get a spark in the cylinder.

The Niagara Self Starter never wears out.

Dealers and Factories Write for Our Proposition.

THE NIAGARA SALES CO., Buffalo, N. Y.



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Overland

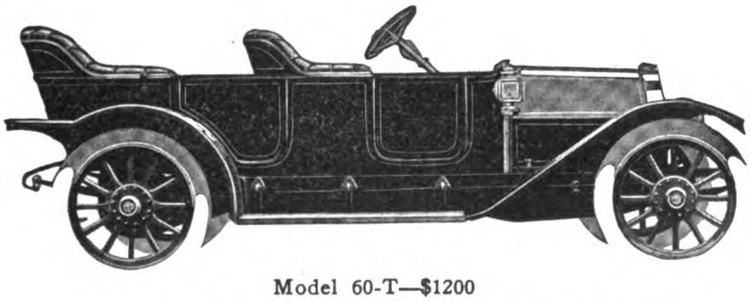
THOUSANDS are talking of the success of the Overland Model 60 at $1200. We firmly believe this model has brought us more satisfaction than any other single model of the season.

It is a car we never have to apologize for. The only complaints are for more deliveries.

The Overland Model 60 has and is smashing individual dealers' records. It makes dealers big operators. Competitors are not able to meet the price—$1200. It is a $1500 value in any other line.

It is a big, serviceable and powerful car. Write us for a catalogue. Ask for book I-47.

The Willys-Overland Company, Toledo, Ohio



Model 60-T—$1200

Wheel base, 111 inches; body, 5-passenger fore-door touring; motor 4⅛ x 4½; horsepower, 35; Remy magneto; tires, 34 x 4 inch Q. D.; equipment, three oil lamps in black and brass finish, two gas lamps, horn and generator. Self-Starter, $20 extra.

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THE MOTOR WORLD

XXXII New York, U. S. A., Thursday, July 4, 1912. No. 2

ILER DIVIDES AMERICAN RIGHTS

ral Vehicle Co. Obtains the Trucks Undisclosed Syndicate the Cars— Men Who Made the Deal.

er several false alarms, the most re- of which stated that the Daimler Mo- o. purposed establishing a factory in ountry for the manufacture of Mer- cars, the Daimler American interests assed into American hands.

rights to the famous German com- trucks and other commercial vehi- ve been acquired by the General Ve- o., of Long Island City, N. Y., which offshoot of the great General Elec- ., and the rights to the Mercedes e cars has been secured by an East- ndicate, the personnel of which is state secret. It, however, will be round the Daimler Import Co., of ork, which at present handles the es car in this country, and of which M. Carples is the general manager. it is known, is a member of the te, which, within the next three will take over and reorganize the company and develop it into a turing corporation.

eparate negotiations for the Daimler ave been conducted almost concur- In the case of the General Vehicle y were consummated by P. D. Wa- resident, and G. W. Wesley, chief of the company, both of whom en in Europe for some six weeks, no inkling of the nature of their permitted to escape, and the fact General Vehicle interests hitherto en wholly centered in electric ve- d electrical affairs generally, sug- ot at all that the big company pro- gaging in the production of gaso- icles of any sort.

e negotiations with the German the syndicate which has obtained to reproduce Mercedes pleasure this country was represented by H. F. Cuntz, the patent expert of the Automobile Board of Trade, which office he also filled in its successor, the Association of Licensed Automobile Manufacturers, of which Carples was traffic manager previous to his assumption of the general management of the Daimler Import Co. Cuntz returned from Germany on Tuesday last, but, like Carples, he will say nothing concerning the identity of those whom he represented on his mission to the Daimler factory and who will comprise the new company.

Atlas Engine Works in Receiver's Hands.

On the application of Frank H. Wheeler and George M. Schebler, who comprise the Wheeler & Schebler Co., of Indianapolis, Judge Weir, sitting in the Indiana Superior Court on Monday last, 1st inst., appointed Fred C. Gardner receiver for the Atlas Engine Works of that city, with authority to continue the business and complete the products now in process of manufacture. In their petition, Wheeler and Schebler, whose claim amounts to $2,387.50, allege that the Atlas company is in danger of insolvency.

In addition to motors of the standard type, the Atlas company, possessed of the only American license granted to an engine manufacturer, has been producing Knight sleeve valve engines, and also has been working on an engine of the Diesel type, all of which has required large outlay and working capital. Its embarrassment grows out of the temporary suspension of payments by its largest customer in the automobile industry, whose indebtedness aggregates $100,000, and who had further requested an indefinite suspension of deliveries of engines for which it had contracted quite heavily.

Locomobile Erecting a Truck Factory.

The Locomobile Co. of America has commenced work on a new building which will be devoted entirely to the production of its trucks. It is expected that the structure, which will adjoin the present plant in Bridgeport, Conn., will be completed within sixty days.

WILLYS TO ACQUIRE GARFORD PLANT

Transaction on Point of Consummation, Willys Purchasing All Common Stock— Garford to Retire from Company.

While reports still are circulating to the effect that having so recently purchased the Gramm Motor Truck Co., of Lima, O., the agreement existing between the Willys-Overland Co. of Toledo, and the Garford Co., of Elyria, whereby the former markets the Garford productions, will be dissolved, John N. Willys is on the point of performing another of his characteristic business strokes which have caused unfeigned and trade-wide surprise. For Willys is about to acquire control of the Garford Co. itself, and unless stumbling blocks interpose, of which there is small likelihood, he will, on Friday next, become possessed of the common stock of the Garford Co., which will place the Garford reins in his hands.

When the transaction is consummated, A. L. Garford, the president of the company bearing his name, will relinquish all interest therein and retire from office. He long has been politically inclined and at this moment appears to be the most likely candidate for the governorship of Ohio in the embryo Progressive party.

The capital stock of the Garford Co. is $2,000,000, of which $1,500,000 is common. In addition to President Garford, the officers are as follows: H. H. Johnson, vice-president; George C. Ford, secretary; Fred N. Smith, treasurer. Directors include E. R. Fanches and Hayden Eames, of Cleveland; Frederick S. Fish, William R. Innis and George M. Studebaker, of South Bend, Ind.

The Garford plant occupies 23 acres and is splendidly well equipped, but many things have combined to prevent the most being made of its facilities. That once in control Willys quickly will remedy this state of affairs is certain. It will give to him not merely direction of the sale of the large, impressive cars—one of them a "six"—and the equally large and imposing trucks

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which constitute the Garford line, but will place their actual manufacture subject to his will and round out the Willys-Overland line to completeness. The transaction partially explains the recent decision to increase the Willys-Overland capital from $6,000,000 to $15,000,000.

Loses Commissions and Must Pay Costs.

Stock subscriptions and signed stock subscriptions apparently are two entirely different things, as Charles Hallock and Michael P. Caffe, who became involved with the Newark Automobile Manufacturing Co., of Newark, N. J., have learned to their cost. Although Hallock claimed to have sold enough of the Newark company's stock on a 15 per cent. commission basis to entitle him to $5,000 for his work, he has not as much to regret as Caffe, who, as assignee in the case, brought action to recover for the commissions and gave a bond which may necessitate the payment of the costs. The case had its beginning last January in the Supreme Court for New York County, when Caffe was granted an attachment against two of the Newark company's cars on exhibition at the Grand Central Palace show. The attachment was vacated on the giving of a bond, and when the case was tried last week Caffe lost, the defense being that Hallock agreed to get "signed" subscriptions but failed to do so. The disputed stock is said to be in the possession of the Newark company.

Brennan Takes up Truck Production.

After having devoted itself to the manufacture of gasolene engines for some 12 years, the Brennan Mfg. Co., of Syracuse, N. Y., has enlarged its sphere and hereafter will engage in truck manufacture. Three models will be produced—one of two tons capacity, mounting a 35 horsepower Brennan four-cylinder motor, one of three tons capacity and 38 horsepower, and a third, a five-ton vehicle employing a 45 horsepower engine. The vehicles will employ progressive transmission, thermo-siphon water cooling, Bosch dual ignition, cone clutch and semi-elliptical springs, with auxiliary cross springs to carry the overload. The Brennan truck department will be in charge of Robert J. Rothwell, who previously was identified with the truck department of the H. H. Franklin Mfg. Co., of Syracuse, N. Y. On a special order, two trucks were produced in the Brennan plant several months since, and they gave such satisfaction that the decision followed to engage regularly in the manufacture of trucks.

Keeton Acquires Plant in Wyandotte.

The Keeton Motor Car Co., of Detroit, has acquired the plant in Wyandotte, Mich., formerly occupied by the Seitz Automobile & Transmission Co. It will be devoted wholly to the production of six-cylinder cars, the Keeton people having abandoned their original intention to make both "fours" and "sixes."

FORD STOPS OHIO PRICE-CUTTER

Court Grants Injunction Restraining "Co-operative" Company—Patents Involved and Other Unusual Features of Suit.

Until further notice, the Union Motor Sales Co., of Dayton, O., will not sell Ford cars as less than list price, or at any other price, the preliminary injunction prayed for by the Ford Motor Co., of Detroit, having been granted by the United States District Court in Cincinnati on Monday last, 1st inst.

The suit, as the Motor World stated last week, is unusual in that it is the first one in which a prominent automobile manufacturer has brought his patents to bear to prevent price cutting. In presenting their case, which is an action in equity, the Ford people cited no less than 10 patents covering mechanical features of their car, among them Nos. 787,908 for a planetary drive gear for shaft drive, 773,934 for a muffler, 847,405 for a reducing steering mechanism, 879,757 for a piston ring, 1,012,186 for a running gear, and 1,005,186 for a transmission mechanism. The language on the metal plate which is placed on the dash of all Ford cars is also cited; it requires that each purchaser of a Ford car register his name and address and date of purchase with the Ford company, "in order to be protected under warranty of the manufacturer."

In the litigation in the Federal Court in Cincinnati, it was also brought out that the Ford dealers, who are termed "dealers-licensees," are required to report their sales each week to the factory and bind themselves not to sell cars at less than list price, or to supply them to others for that purpose, the contract, which is termed a "license agreement," stipulating for damages in case of a breach of its terms.

The Union Motor Sales Co., which is incorporated under the easy laws of Maine, is one of the so-called co-operative institutions which undertakes to sell cars and accessories at less than list price to its "members" or "subscribers," who are required to purchase one share of stock at a cost of $10. According to the argument presented, the Ford company, in February last, informed an inquirer that the Union Motor Sales Co. "had not been able to deliver a single Ford car," and that "its principal graft was selling $10 worth of stock." The Sales company became possessed of this letter and immediately addressed an indignant communication to the Ford people, demanding a retraction of the statements made, lacking which direful proceedings were threatened. The Ford company promptly replied that it had no intention of retracting anything. Instead, it instituted the present proceedings, in which it asks damages in the sum of $50,000, it being alleged that the defendants had "traded upon the goodwill and high reputation" of the Ford company, and conspired to infringe the Ford patents and to induce dealers-licensees to break their contracts and to otherwise injure the Ford business, and that the same "has been done and is being done, maliciously and fraudulently."

Gramm Organizes a New Company.

B. A. Gramm, who only some two months since disposed of all save a nominal interest in the Gramm Motor Truck Co., of Lima, O., to John N. Willys, of Toledo, has lost no time in carrying out his plans for the organization of another company to produce trucks of his design. It was formally organized last week, under the style Gramm-Bernstein Co. Max Bernstein is president, B. A. Gramm vice-president and general manager and Harry O. Bentley secretary-treasurer. Dudley Bernstein and Fred Biezants, who was Gramm's former superintendent, are the additional directors.

The company has been incorporated under the laws of Ohio with authorized capital of $500,000, of which 3,000 shares are common stock and 2,000 shares preferred. Max Bernstein, the president of the new company, is a millionaire junk dealer and mattress manufacturer, and as Gramm himself does not lack resources, the new enterprise is inaugurated under favorable auspices.

The manufacture of trucks, which will be of 2, 4 and 6 ton capacity, will be carried on in a former paper mill in Lima which has been acquired for the purpose, and in which the necessary machinery already has been installed. It is expected that the first Gramm-Bernstein truck will make its appearance early in October.

Billings Succeeds Barnes in M. A. M. Office.

Claire F. Barnes tendered his resignation as a director and as third vice-president at the regular meeting of the board of directors of the Motor and Accessory Manufacturers, which occurred in the organization's New York offices on Friday last, 28th ult. It was accepted with regret, and F. C. Billings, of the Billings & Spencer Co., Hartford, Conn., was chosen to fill the vacant vice-presidency, and William H. Crosby, of The Crosby Co., Buffalo, N. Y., to fill the vacant directorship. Their terms will expire in January next. At the same meeting, three new members were added to the M. A. M. roll, as follows: Hood Rubber Co., Boston, Mass.; Lefever Arms Co., Syracuse, N. Y., and the American Hardware Corporation (Corbin Screw Corporation Division), New Britain, Conn.

Todd to Produce Sheet Metal Fittings.

The Todd Mfg. Co., of Minneapolis, Minn., of which Frank Todd, former superintendent of the Long Mfg. Co., of Chicago, is the moving spirit, has commenced the manufacture of hoods, fenders, drip pans, tanks and other sheet metal specialties. Todd's associates in the enterprise are P. A. Wolfe and Morgan C. Wood.

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MAY THE MERRIEST OF ALL MONTHS

Exports Pass the $3,000,000 Mark and Set up a New Record—France Alone Reduces its Purchases.

Although April, exceeding the automobile exports of January by nearly $200,000, aspired to the position of record month in the history of automobile exportation, its pride of position was even shorter-lived than January's, for the month of May, with a magnificent total valuation of $3,412,790, exceeded April by $686,290, and therefore takes rank as the banner month. Also, compared with the corresponding month of 1911 May shows a gain of $1,555,364 over the exports, a gain of 83 per cent.

Of the total valuation of the May, 1912, exports, $2,963,818 is represented by 3,009 cars, the remaining $448,972 being the worth of parts, which compares with 1,466 cars, valued at $1,513,547 exported in May a year ago, and parts listed at $343,879—a gain in number of cars of over 100 per cent. and in value of nearly 100 per cent. The average price of cars, however, fell from $1,032 in May, 1911, to $951 for the same month of the present year.

Canada, as long has been the case, was the largest taker of America's automobiles, at buying 1,109 cars, valued at $1,352,856, and thereby increasing its April purchases by some $245,000. The next largest importer of cars from the United States was the United Kingdom, which found a market for a product valued at $465,722, running but little ahead of the next geographical division, British Oceania, which received $412,565 worth of automobiles.

But one country recorded a loss, France showing a shrinkage of $22,942. The principal gains in order of magnitude were: British Oceania, $302,752; United Kingdom, $262,183; Canada, $245,751; Asia and Other Oceania, $87,553. The record for the eleven month ending May, 1912, which is $23,179,285, indicates a total for the governmental year ending June 30 of more than $26,000,000. The statistics in detail are as follows:

	May				Eleven Months Ending May					
	1911		1912		1910		1911		1912	
	Quantities.	Values.	Quantities.	Values.	Quantities.	Values.	Quantities.	Values.	Quantities.	Values.
Automobiles	1,466	$1,513,547	3,009	$2,963,818	5,942	$7,910,379	10,249	$11,262,177	19,816	$19,433,965
Exported to—										
United Kingdom		203,539	673	465,722		2,038,843		2,066,297	5,389	4,231,487
France		71,922	63	48,980		584,404		494,173	507	419,816
Germany		19,972	49	36,719		227,235		231,743	261	190,440
Italy		22,125	30	35,605		319,451		196,524	169	157,852
Other Europe		89,554	204	155,125		420,889		646,732	1,062	870,311
Canada		1,107,105	1,109	1,352,856		3,721,862		5,912,794	5,533	6,534,088
Mexico		11,990	8	15,370		501,219		608,805	266	410,129
West Indies and Bermuda		27,436	29	36,237		406,553		370,869	299	318,618
South America		104,172	162	183,292		296,558		792,093	1,444	1,736,921
British Oceania		109,813	445	412,565		319,555		1,146,402	3,479	3,137,612
Asia and other Oceania		61,756	152	149,309		310,198		733,769	1,001	1,038,677
Other countries		28,042	85	72,038		148,648		281,270	406	388,014
Parts of (except tires)		343,879		448,972		1,385,036		2,219,294		3,745,320
Total		$1,857,426		$3,412,790		$9,295,415		$13,481,471		$23,179,285

Lion Resumes Operations in Adrian.

Despite reports that the Lion Motor Car Co., whose plant in Adrian, Mich., was destroyed by fire on June 2nd, would locate elsewhere, the company will do nothing of the sort. It has secured another and larger factory building in Adrian and, fortified by the Industrial Association of that city, which has guaranteed $100,000, operations have been resumed and it is stated that the first Lion to be born in the new home will be ready for demonstration within two weeks. and that cars will be ready for delivery within 90 days.

May Tire Exports Show Falling Off.

The valuation of American tires exported from the United States during May, 1912, shows a slight falling off as compared with the value of the tires exported during the same month a year before, the figure for May, 1912, being $272,317 and for the preceding May $310,346, a loss of 12 per cent. While this comparison is unfavorable to 1912, a comparison of exports for the 11-month periods ending with the Mays of 1911 and 1912 shows a gain of 21 per cent.—$1,838,482 as against the latter $2,335,920, a gain of $497,438.

De Lisser Returns to Ajax Tires.

Horace De Lisser, vice-president of the United States Motor Co., has resigned that office to rejoin his earlier love, the Ajax-Grieb Rubber Co., of Trenton, N. J., of which he once was president. He will become chairman of the board of directors. De Lisser will sail to Europe on the Kaiser Wilhelm der Grosse on July 30th and will be absent for six or eight weeks, during which period he will forward plans for the establishment of an Ajax factory in Europe which already are well in hand.

No Michigan Rim Plant for Mott.

Reports which first were printed in Detroit to the effect that the Mott Wheel Works, of Utica, N. Y., had completed arrangements for the establishment of a branch rim factory in Jackson, Mich., are denied in toto by the Mott people. Treasurer Williams states that there is no intention to establish a branch in Jackson, or any other locality.

OWEN-REO CASE STILL UNSETTLED

Jury Disagrees in $500,000 Action and New Trial Probable—Owen Car's "Commercial Practicability" an Issue.

Whether the Owen car is or was "commercially practicable," and whether the Reo Motor Truck Co., of Lansing, Mich., agreed to pay the Owen Motor Car Co., of Detroit, $500,000 damages, are questions which still remain undetermined. The jury in the Wayne County Circuit Court in Detroit, which for four weeks wrestled with the problems and listened to voluminous testimony, was unable to reach an agreement and was discharged last week, which will require that the case be retried, unless it is settled out of court.

The suit grew out of the sale in October, 1910, of the Owen Motor Car Co. to the Reo Motor Truck Co., of which latter R. E. Owen is president. According to the contract, the Reo company bound itself to purchase the Owen machinery, tools, patterns, etc., for the sum of $100,000, payable in Reo truck stock, the stock to be issued to Angus Smith, treasurer of the Owen company, as trustee for the Owen stockholders. In addition, the Reo company agreed to purchase such Owen material as proved acceptable, paying therefor, for a period of one year, the net profits derived from the manufacture and sale of the Owen car, the Reo company retaining but 10 per cent. of such profits. At the expiration of the year, it was provided that the receipts from the sale of the Owen car should be divided on a then mutually agreeable basis, the Owen company agreeing to liquidate its affairs as early as possible, and within five years from the date of the contract to convey a majority of its capital stock to R. E. Olds as trustee for the Reo stockholders.

After the contract had been entered into, the Reo company manufactured 35 Owen cars, of which it sold 31, most of them being marketed through agents of the Reo Motor Car Co., of which the Reo Motor Truck Co. is a subsidiary. The process of

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manufacture and marketing proved so expensive, however, that the Reo interests decided that the Owen was not a "commercially practicable proposition" and, accordingly, its manufacture was abandoned.

When this came to pass, the Owen interests promptly asserted themselves, making protest and demand that the manufacture of their car be continued. As their protests availed nothing, they represented to the Reo company that its action in the matter had damaged the Owen interests to the sum of $500,000 and, if the Owen story is accepted, the Reo company agreed and promised to pay that amount. When, despite repeated demands, it failed to do so, the Owen Motor Car Co. instituted the action in which the jury last week disagreed.

It was brought out in the testimony that of the parts and materials involved in the contract $22,289.64 worth had been used for free replacements, and that the Owen company had received $27,700 as its share of the receipts from the cars which had been manufactured and marketed by the Reo Motor Truck Co. It also was disclosed that before the suit came to trial negotiations looking toward an amicable settlement had been made, in the course of which the Reo company offered to pay the Owen people a certain sum of money, amount not named, and to turn back to them all of the materials and parts in dispute, or to pay a certain sum and keep the materials and parts, the original price of which, according to the plaintiff's figures, was, approximately, $270,000, and also the jigs, patterns, tools, etc., involved in the transaction, which represented an invoiced valuation exceeding $40,000. Apparently, the money offer was too small and the settlement was refused.

Austins to Become $500,000 Corporation.

James E. and Walter S. Austin, father and son, who, trading as the Austin Automobile Co., of Grand Rapids, Mich., for ten years have built in limited quantities one of the largest and most imposing cars that has come out of the West, finally have admitted new men and new capital to the business, which is to be enlarged and otherwise expanded in every way. George H. Davidson and William R. Shelby, of Grand Rapids, are the men who have become interested and who, with the Austins, are engaged in the organization of a $500,000 corporation, which will take over the Austin interests and seek to make the Austin car a real factor in the trade. Of the capital, $300,000 will be represented by common stock and $200,000 by 6 per cent. preferred. The shares will be offered for public subscription and it is probable that a bonus of 50 per cent. common will be given with each purchase of preferred.

The Packers Motor Truck Co., of Wheeling, W. Va., has opened a New York office in the United States Rubber Building, 1784 Broadway. A service station also will be maintained on West 42d street.

DECIDES PREST-O-LITE PATENT DEAD

Judge Kohlsaat, in Searchlight Case, Disagrees With Eight Other Federal Courts—Old Law Involved.

Although seven United States District Courts and one United States Circuit Court of Appeals have decided that the Claude and Hess patent under which the Prest-O-Lite Co., of Indianapolis, manufactures and markets its product is alive and is still entitled to a lease of existence for some five years, Justice Kohlsaat, of the United States District Court for the Northern District of Illinois, has decided that the patent is quite dead. His decision, rendered last week in the long pending action brought by the Prest-O-Lite people against the Searchlight Gas Co., of Chicago, sustained his denial of a preliminary injunction, and until the case is fought out in the Court of Appeals, gives the Searchlight company the right to continue its business as heretofore, within that judicial district. The numerous other decisions favorable to the Prest-O-Lite company are its basis for carrying the case higher.

The whole line of suits hinges about a point of patent law. The statute prior to 1897 held that a foreign patent taken out in the United States expired at the same time as the foreign patent, but the law was amended in 1897, and the limitation was removed, but the limitation still was imposed upon patents for which application had been made prior to the change in the law. The application for the Claude and Hess patent was made prior to 1897, but it was not granted until December 25, 1900, when it was given the number 664,383, while the English patent is number 29,750 and officially expired June 30, 1910. The English and American patents are to the lay mind somewhat similar, and the contention of the defense in the Prest-O-Lite cases is that the American patent is the same as the English grant, and since application was made prior to 1897 it has expired. The Prest-O-Lite contention, which has thus far been upheld, is that the English patent covers a "process," consisting of a method of holding the gas in solution and of regulating other details, while the American patent covers an "apparatus," consisting of the tank, valves, gas and whole outfit. The patent has been upheld by United States courts in Michigan, Indiana, Missouri, California, Washington, Colorado and Texas and the Circuit Court of Appeals of the 6th circuit. Judge Kohlsaat's is the first decision in the negative.

White Wins in Dealership Dispute.

Difficulties encountered by The White Co., of Cleveland, O., with the White Motor Co., its former Brooklyn dealer, after considerable litigation in the New York City Court, were adjudicated last week, when the former was given a verdict for $4,422.70 against the dealer and Philip S. Saitta, a New York attorney, the amount in dispute arising from notes which had been given. These notes were alleged to have been given when the dealer signed the White contract and to have been endorsed by Saitta. When the contract was broken after various disagreements, the White Co. sought to collect on the paper.

Creditors Seek to Prevent Van-L Transfer.

Although the Van-L Commercial Car Co., of Grand Rapids, Mich., was supposed to have been taken over in March last by the Commercial Service Truck Co., a $175,000 corporation of which Philip Moran is president, it appears that the transaction did not proceed to such a point as to prevent the filing of a petition in bankruptcy against the Van-L concern; for such a petition was filed last week in the United States District Court in Grand Rapids, which was followed by another petition of the same creditors, Arthur Gelock and John W. and W. L. Landman, praying for the appointment of a receiver. They allege that the Van-L company has transferred, or attempted to transfer, its assets to the Commercial Service Truck Co. without authority and without consideration, and in fraud of the Van-L creditors and stockholders, and that the Commercial Service Truck Co. was organized for the sole purpose of taking over the Van-L assets.

Weed Denied Preliminary Injunction.

Because the Weed tire chain adjuster patent, No. 953,673, had not been adjudicated—that is, had not been previously the basis of a suit against an alleged infringer—the application of the Weed Chain Tire Grip Co. for a preliminary injunction against Charles Weiland and the 35% Automobile Supply Co., of New York City, was denied this week in United States District Court for the Southern District of New York, and the Weed people will be unable to get a decision of any kind until the suit has been threshed out in court. The patent covers a device consisting of springs extending from the chain grips toward the center of the wheel, holding the grips against the tire.

Republic to Increase Capital to $10,000,000.

Directors of the Republic Rubber Co., of Youngstown, O., have recommended an increase of capital from $4,000,000 to $10,000,000, the recommendation being now before the stockholders for approval, which there is small doubt will be given. The new stock will consist of $6,000,000 common and $4,000,000 preferred. It was less than two years ago that the Republic capital was increased from $2,500,000 to $4,000,000. The expansion of the business in that period has been such as to necessitate another and larger increase. The establishment of a reclaiming plant is one of the things in view, which will be brought about when the new money is rendered available.

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THE WEEK'S INCORPORATIONS




Detroit, Mich.—Capital Auto Lock Co., under Michigan laws, with $10,000 capital; to manufacture accessories.

Saginaw, Mich.—American Steam Truck Co., under Michigan laws, with $10,000 capital; to manufacture motor trucks.

Portland, Me.—Essenkay Sales Co., under Maine laws, with $50,000 capital; to deal in motor accessories. Corporators — D. J. Snow, H. P. Sweetster, and others.

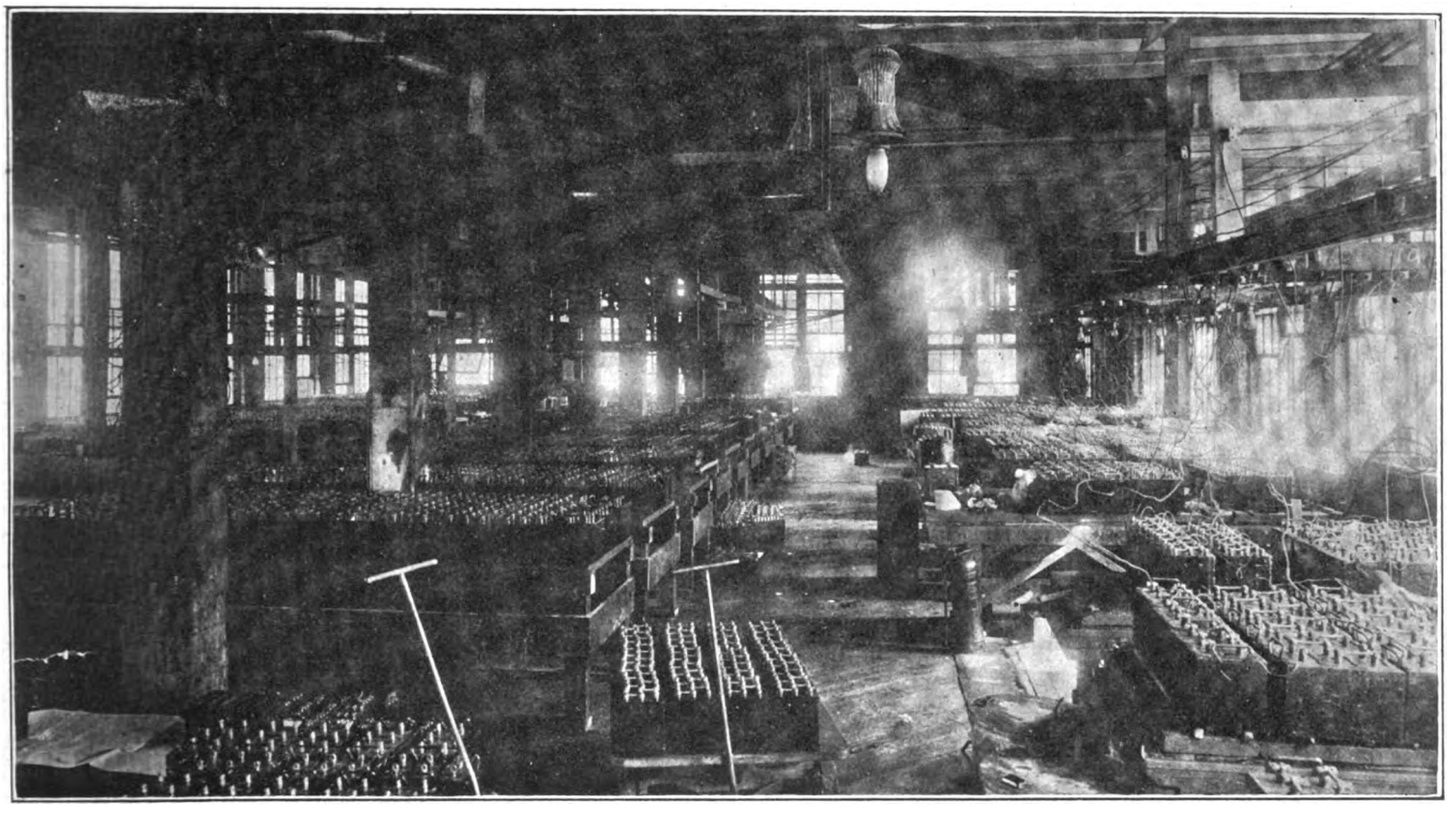
—Charles Leviton, Jesse Lowenhaupt, Sigmund E. Loeb.

Muncie, Ind.—Feeney-Hurd Co., under Indiana laws, with $20,000 capital; to manufacture automobile accessories. Corporators—Edmund J. Feeney, James H. Leffle, Carl E. Hurd.

Chilton, Wis.—Hippe Motor Car Co., under Wisconsin laws, with $15,000 capital; to deal in motor cars. Corporators—Robert

Lima, Ohio. — Gramm - Bernstein Co., under Ohio laws, with $500,000 capital; to manufacture motor vehicles. Corporators —B. A. Gramm, Max Bernstein, Fred Biezants, Dudley Bernstein and H. O. Bentley.

Westfield, Mass.—Westfield Motor Truck Co., under Massachusetts laws, with $100,000 capital; to manufacture and deal in motor vehicles. Corporators — Ernest L.



INTERIOR OF A STORAGE BATTERY DEVELOPING ROOM—VIEW IN WILLARD FACTORY IN CLEVELAND

South Bend, Ind.—Otis Motor Car Co., under Indiana laws, with $10,000 capital; to manufacture motor cars. Corporators—N. L. Otis, J. B. Beattie, Gilbert Squires.

Florida, N. Y.—Florida Garage Co., under New York laws, with $6,000 capital; to operate a garage. Corporators — Calvin C. Crawford, Mary E. Crawford, Alfred E. Winser.

San Francisco, Cal.—Peninsular Automobile Co., under California laws, with $15,000 capital; to deal in motor cars. Corporators—H. E. Holmes, John D. Gish, W. T. Chubbuck.

Chicago, Ill.—Washington Motor Livery Co., under Illinois laws, with $75,000 capital; to operate a motor livery. Corporators H. Hippe, Herman Gierow, F. J. Egerer, George J. Berger.

Toledo, Ohio.—Rubernix Mfg. Co., under Ohio laws, with $10,000 capital; to manufacture tire filler. Corporators—Edward O. McLain, L. E. Fike, M. N. Dickey, L. M. Florey, F. E. Calkins.

Jersey City, N. J.—Republic Auto Tire Vulcanizing Co., under New Jersey laws, with $25,000 capital; to deal in tires and accessories. Corporators — W. Merkel, P. W. Stainard, M. Levine.

Lancaster, Pa. — Keystone Automobile Exchange, under Pennsylvania laws, with $100,000 capital; to deal in motor cars. Corporators—James W. White, Clarence J. Jacobs, Harry W. Davis.

Hull, Henry W. Hallebourg, Walter F. Mogill.

Nashville, Tenn.—Seaton Wheel Co., under Tennessee laws, with $130,000 capital; to manufacture automobile wheels. Corporators—Granberry Jackson, Samuel S. Lord, B. C. Seaton, John T. Landis, J. Ray Boone.

Columbus, Ohio.—Everitt Auto Sales Co., under Ohio laws, with $30,000 capital; to deal in motor cars. Corporators—Horace K. Dobson, Amos F. White, Elmer F. McConaha, H. H. Kellenberger, A. W. Daving.

Columbus, Ohio.—Federal Auto Accessories Co., under Ohio laws, with $2,000 capital; to deal in motor accessories. Cor-

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porators—J. R. Loofburrow, N. M. McDonald, W. C. Weatherhole, E. J. Mace, M. L. Mace.

Cleveland, Ohio.—Auto Owners Co., under Ohio laws, with $25,000 capital; to deal in motor cars and accessories. Corporators—P. A. Leighly, W. K. Stanley, H. N. Pettibone, Frank H. Forest, John Grienheimer.

Schenectady, N. Y.—Brenner-Hardt Co., under New York laws, with $3,000 capital; to deal in motor vehicles. Corporators—Adam E. Brenner, 517 Hamilton street; Louis Hardt, Amelia Hardt, both of 151 Green street.

New York, N. Y.—D. K. & D. Co., under New York laws, with $5,000 capital; to manufacture motors. Corporators — Eckford C. DeKay, Sidney G. DeKay, both of 50 West 9th street; Andrew C. Dam, 141 West 39th street.

Brooklyn, N. Y.—Saratoga Auto Co., under New York laws, with $5,000 capital; to deal in motor cars. Corporators—George D. Smith, 2123 Metropolitan avenue; Harry A. Bogard, Emily J. Bogard, both of 18 Furman avenue.

Buffalo, N. Y.—Automobile-Vehicle Corporation, under New York laws, with $20,000 capital; to deal in motor vehicles. Corporators—L. A. Kenyon, 274 Dewitt street; Frank H. O'Neil, 823 Genesee, street; Otto A. Hagelin, 533 Oak street.

New York, N. Y.—Goldfinger Auto Renting Co., under New York laws, with $2,000 capital; to rent automobiles. Corporators—Benedict Goldfinger, Richmond Hill; Walter E. Fisher, 73 West 92d street; Isaac Wolf, 205 West 136th street.

New York, N. Y.—C. & T. Auto Specialty Co., under New York laws, with $10,000 capital; to deal in motor accessories. Corporators—George F. Connelley, 3505 Broadway; John J. Treacy, 3 West 63d street; John R. Hunt, 867 39th street.

New York, N. Y.—American Society of Automobile Owners, Inc., under New York laws, with $10,000 capital. Corporators—Robert S. Kennedy, 790 Riverside avenue; Joseph C. Murray, 29 Broadway; Alexander Woods, 228 Hart street, Brooklyn.

New York, N. Y.—Resilient Punctureless Tire Co., under New York laws, with $200,000 capital; to manufacture tires. Corporators—Seth H. Sheldon, 106 West 71st street; Flossie H. McCready, Leroy McCready, both of 62 West 93d street.

New York, N. Y.—Republic Motor Co. of New York, Inc., under New York laws, with $500 capital; to manufacture motor trucks, etc. Corporators—Frank H. Twyeffort, 67 Hancock street, Brooklyn; Stephen C. Fiero, 159 Bainbridge street, Brooklyn, Ernest J. Ellenwood, 34 Maple Court, Flatbush.

Poughkeepsie, N. Y.—A. B. Manufacturing Co., under New York laws, with $200,000 capital; to manufacture automobile devices. Corporators—Max M. Ketzen, 237 West 111th street, New York City; Jacob Litchenstein, 995 Union avenue, New York City; Ralph H. Raphael, 520 West 122nd street, New York City.

New York, N. Y.—Service Recorder Co., of New York, under New York laws, with $10,000 capital; to manufacture automobile devices. Corporators—Harold F. Seymour, 1923 East 90th street, Cleveland, Ohio; Frederick Seymour, 55 Prospect street, East Orange, N. J.; Benjamin N. Levy, 82 West Washington Place, New York City.

Independence Acquires Carter Assets.

At the public sale of the Hyattsville (Md.) plant of the bankrupt Carter Motor Car Corporation last week, the property was bid in by P. M. Galvin, acting for the Independence Motors Co., which was formed for the purpose by H. O. Carter and other principals of the defunct company. Originally, Carter formed the Washington Motor Car Corporation to acquire the property and continue the manufacture of the Washington car, but for some reason it was replaced by the Independence company. The production of the Washington car will be continued, but henceforth it will be styled the Independence car. The price paid at the auction last week was $12,000, the sale including the real estate, buildings and factory equipment. It is understood that the common stock of the Independence company will be issued to the former stockholders in the Carter Motor Car Corporation, in order that they may feel that they have saved something from the wreck.

Banker's Son Causes Mercer to Sue.

An escapade on the part of the son of a New York bank president is responsible for an action brought last week in the Supreme Court for New York County by the Mercer Automobile Co., of Trenton, N. J., against the Auto Credit Co. and the Auto Owners' Sales Co., of New York City, to establish the ownership of a Mercer car which the Trenton company supposed it had sold to the bank president's son. The young man corresponded with the Mercer company and subsequently the car was delivered to him, whereupon he drew a check on his father's bank. When the check was returned marked "No Funds," the Mercer people instituted inquiry and found the car in the possession of the defendants, who claimed they had advanced money on it. The Mercer company promptly replevined the car, and now sue to establish true ownership.

Hitch in Parish-Orson Settlement.

Although the attorney for the Parish Mfg. Co., of Reading, Pa., manufacturer of frames, among other things, withdrew his complaint when that company's case against the Orson Automobile Co. was reached in the New York City Court some two weeks ago, the expected settlement of the dispute did not immediately materialize. While it was understood by the Parish people that their bill of $501.11 for labor performed and materials would be paid, the check was slow in appearing, and accordingly application was made for the reinstatement of the cause on the calendar, and the judge ruled that such would be done unless payment were made by June 26. This date passed without settlement, and if the check does not appear by the time court opens in the Fall the serving of an order on the calendar clerk will place the case where it was before overtures of settlement were made. The trouble grows out of a contract for 100 frames made by the Parish company with the Orson concern when the latter, with much gusto, threatened to make some splurge in the automobile manufacturing field. The contract never was completed, and the Parish company sued for lost profits and money expended on what work it had done. In offering to compromise and settle, the Orson company stipulated that whatever it paid be deducted from the total amount of the contract were completed.

Alfred N. Mayo Succumbs to Operation.

As the result of an operation for cancer performed the same afternoon, Alfred N. Mayo, treasurer of both the Fisk Rubber Co. and the Knox Automobile Co., died late Friday evening, June 28th, at the Wesson Memorial Hospital, Springfield, Mass. He had returned from Chicago four weeks before, suffering from what was believed to be ptomaine poisoning, but which was found to be the cancer which proved fatal. Mr. Mayo was born in Springfield in 1844 and had resided in that city all his life. He long had been prominent both socially and commercially in the city, his interests in the Fisk and Knox companies being but two of several industries with which he was identified. He was a veteran of the Civil War. He is survived by his mother, his wife and three daughters, one of whom, Mrs. Harry G. Fisk, is the wife of the president of the Fisk Rubber Co.

Gemmer's President in Fatal Accident.

Edward A. Skae, president of the Gemmer Mfg. Co. and an officer of the Federal Motor Truck Co., among other Detroit enterprises, and also the head of the Michigan State Automobile Association, was instantly killed on Thursday last, June 27th, when an automobile in which he was a passenger skidded off the road and overturned in a ditch near Birmingham, Mich. Skae, who was born in Canada in 1871, had been a resident of Detroit for some 20 years, and was prominent both in commercial and social circles. He leaves a mother, a widow and four children.

Rassel Becomes the Toledo Truck.

Following the withdrawal of W. De Arnold, the Rassel Motor Car Co., of Toledo, has changed its name to the Toledo Motor Truck Co. De Arnold for some time had been seeking to acquire the Rassel property, but, failing, withdrew to form a company bearing his own name, which, however, has not yet come into being.

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A. L. Hurr is about to erect a garage in Shakopee, Minn.

Joseph B. Vincent of Ceres, Cal., is about to open a repair shop.

M. G. Bally, of Springfield, Ore., has purchased an interest in the Gittins Garage.

C. H. Hildreth, 2d, has opened a garage, 65 x 100 feet, on Seaver street, Worcester, Mass.

J. C. Brown has purchased the Union Garage in Lakeland, Fla; H. D. Sloan was the former owner.

The Wheeling Mold & Foundry Co. is about to enter the garage business in Wheeling, W. Va.

Orville McDonald of Mapleton, Minn., has leased the Benz Building and will remodel it into a garage.

John Sievers of Valpariaso, Ind., has secured authority to build a garage 80 x 100 feet; it will cost $6,000.

Under the style, Buckingham Auto Garage, J. W. Buckingham and J. T. Peck have "opened up" in Welsh, Ia.

The firm of White, Ware & Leatherbee, of Boston, Mass., has been dissolved. It handled the Bergdoll car.

Charles Wason, of 2909 Euclid avenue, Cleveland, O., has secured permission to build a garage; it will cost $3,000.

W. K. McKnight, of Alexis, Ill., has become a dealer; he has arranged to represent the Henderson Motor Car Co.

Hammonton Garage and Machine Works is the style of a new concern in Hammonton, N. J. W. S. Turner is the proprietor.

Frank Robinson of Healdsburg, Cal., has purchased the interest of his partner, Sidney Groshong, in the Fitch Mount Tavern Garage.

Permission has been granted Nelson L. Elmer, of Springfield, Mass., to erect a garage at 13-21 Cross street; the cost will be $32,000.

The Florell Auto Co., of Iron Mountain, Mich., is about to open a garage in Negaunee, the same State; a livery service also will be operated.

Thomas Girling of the Girling-Warner Automobile Co., Anoka, Minn., has purchased the Warner interest; Girling will continue the business.

Under the style First Garage & Motor Co., H. W. Smith has opened for business at 222 Huron street, Toledo, O. He has accommodations for 40 cars.

Under the style, the Service Garage, a new company has been organized in Plainfield, N. J., with E. A. Craig as manager; Henderson cars will be stocked.

Frank P. Davis has taken over the J. S. Richtey garage business in Merced, Cal.; Davis formerly was in the automobile trade in Bakersfield, in the same state.

Claude Oswalt of Leavenworth, Kan., has purchased an interest in the Clyde Wilson Garage in Gravity, in the same state; the new style will be Wilson & Oswalt.

James A. Binney, of 587 Boylston street, Boston, Mass., has become a Henderson dealer; he will maintain a three-story service building apart from his sales rooms.

J. M. McDonald has opened a garage in Wethersfield, Conn. He was for six years in the employ of a Hartford automobile firm, and therefore does not lack experience.

Vaughan & Less, proprietors of the Century Garage, in Watsonville, Cal., have sold their interests to Robert Neill and Claude Redwine; the latter will manage the business.

A. B. and Mason Towle, formerly of Joliet, Ill., are about to enter the automobile field in Cincinnati, O., as Cadillac dealers; they will incorporate under the style Cadillac Motor Sales Agency.

Benjamin Ciegel, of Detroit, Mich., is securing estimates on a service building and garage to be erected at Lafayette, 12th and West Fort streets; the structure will represent an expenditure of $60,000.

J. R. Overstreet, of Fort Worth, Tex., has entered the trade in that city, handling the Lambert line; his territory comprises Texas, Oklahoma, Arkansas, Louisiana, Colorado, New Mexico and Arizona.

George Ostendorf, who was associated with H. E. Crosby as Franklin dealers in Buffalo, N. Y., under the style George Ostendorf Co., has purchased Crosby's interest; Ostendorf will continue the business alone.

The Mercer Automobile Co., of Trenton, N. J., has opened a Kansas City (Mo.) branch at 1524 Grand avenue; Roy O. Kendall, formerly connected with the D. A. Kendall Motor Car Co., of that city, is manager.

The Mattoon (Ill.) Refrigerating Co. has entered the automobile trade and will handle Henderson cars; George O. Cobb will manage the business, which will be conducted in a new two-story sales and service building.

The Seeberger Motor Co., located on North Elm street, Creston, Ia., has gone out of business, the stock of accessories being purchased by H. W. Edaburn, owner of the Cadillac Garage; Seeberger will remove to Portland, Ore.

Bruno Seibel, who has won considerable fame on the Pacific Coast as a racing driver, will open a garage in the Bidwell Building on West Third street, San Bernardino, Cal., when the building is completed; he is now connected with another garage.

W. A. Wicks, for the past five years a member of the engineering staff of the H. H. Franklin Manufacturing Co., of Syracuse, N. Y., has resigned to engage in the retail trade in Seattle, Wash. Quite naturally, he will handle the Franklin line.

Leo Collier, former manager of the Lawrence Auto Co., of New Castle, O., has sold out his interests and will become identified with the business of his father-in-law, Milton B. Coombs; the latter is proprietor of the Buick Garage in Youngstown, O.

The Essenkay Sales Co. of California and Arizona has been formed in Los Angeles to act as Pacific Coast distributer of the tire filler of that name. L. N. Brunswig, of the Brunswig Drug Co., of Los Angeles, is the moving spirit in the new organization.

S. L. Buchanan and T. D. Levering, owners of the Motor Truck Co., 407 Rosabel street, St. Paul, Minn., have purchased the lease of the Genge Power Vehicle Co. to the premises at 353 Main street; they plan to establish a large commercial vehicle business.

Edward Dixon and M. Gray, former employes of the Square Deal Auto Co., of Monroe, Wis., have purchased the interest of Emil Hokanson of Madison. With A. L. Maddrell, who has been manager of the business, they continue under the old style.

W. F. Kneip, for six years commercial car engineer for the H. H. Franklin Mfg. Co., of Syracuse, N. Y., and E. F. Williams, a member of the testing department, have resigned to enter the retail trade in Kansas City, Mo. They will, of course, handle the Franklin.

Glenn A. Tisdale, Franklin dealer in New York City, has purchased a controlling interest in John J. Kerwin & Co., automobile repairers, at 248 West 80th street. The latter firm has handled the Franklin repair work, which, with the sales business, is now under the one head.

The Auto Tire & Repair Co., which conducts a general tire and repair business in Toledo, O., has changed its name to Peerless Rubber & Tire Co. and removed its place of business from Ontario street to the new Thatcher building in Madison street. Elmer Allmeroth retains the managership.

The stock of the West Side Garage and Motor Co., of 160-162 West 101st street, New York City, has been sold by M. M. Hayward & Co., acting for the estate of

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Abram Christie, to Thompson J. Wheeler, president of the New Taxicab & Auto Co. The buyer has a ten-year lease of the premises.

Herbert J. Ellis, former head of the Ellis Brick Co., of Toledo, O., has purchased an interest in the McLeary Engineering Co., of that city, and became its treasurer on Monday last; the company, which, besides repairing and rebuilding cars, handles the Buick line, will increase its capital and scope of business.

The Federal Motor Car Co., operating a garage on Henry street, Oakland, Pa., has been placed in the hands of a receiver, William J. Zahniser, following the filing of a bill in equity in Common Pleas Court by Charles E. Pette. The latter, a stockholder and creditor, states there are mortgages of $47,000 against the company's property.

"Studebaker Service Station" is the name on the signboard over the place of business of the Brandenburg & Pearson Co., which has opened up at 446 D street, San Bernardino, Cal. E. C. Brandenburg, of the firm, formerly was with the Weinstock-Nichols Co., and Pearson was Studebaker agent in San Diego. Of course, Studebaker cars are handled.

The Canada Overland Co., Ltd., of Regina, Saskatchewan, has changed its name to the United Motor Co., Ltd. F. R. Mahoney is manager of the concern, which has the Overland agency. George R. Rastall was the head of the original company and he gave the Willys-Overland Co. a lot of trouble by pre-empting and registering the name "Overland" in his own name. He, however, has no connection with the United Motor Co.

Recent Losses by Fire.

Chicago, Ill.—The Prest-O-Lite Co., 1912 South 52d street, plant damaged. Loss, $15,000.

Fresno, Cal.—William Helm, J street, garage and five cars destroyed. Loss, $10,000.

Jacksonville, Fla.—Switzer & Hickling Garage, 220 West Monroe street, garage and two cars damaged. Loss, $7,000.

New York, N. Y.—Eureka Garage, St. Nicholas avenue and 122d street, damaged by exploding air tank.

Dealer Sues and Gets Deposit Back.

That the dealer who fails to take the cars he agreed to take and who believes he has some right to the return of all or a part of his deposit may not be entirely in the wrong, if he has facts to substantiate his case, is indicated by a decision rendered last week in Municipal Court of New York City, where the Rhode Island Motor Car Co. of Providence, R. I., was given a verdict of $498.36, including costs, against the Correja Motor Car Co., of New York City. The Rhode Island concern signed up as dealer September 1, 1910, and deposited $450, which, it is claimed, was to be returned to it at the end of a year, the dealer also contracting for a certain number of cars. Two runabouts were shipped and one was delivered to a customer, the other being retained as a demonstrator, and immediately the Rhode Island concern began sending complaints to the Correja company, their burden being that gasolene tanks leaked, front springs broke, transmission gears were defective, differentials gave trouble, brakes were loose, brake drums were badly worn, a rear axle was weak and worn and the Providence man's story was filled with woe. The Rhode Islanders claimed they tried to get the Correja company to make good, but, being unsuccessful, they brought suit for the return of their deposit.

Changes Among Prominent Tradesmen.

C. D. Clement has resigned the management of the Spokane branch of the Goodyear Tire & Rubber Co. He will return to old San Francisco, whence he came, and re-engage in the automobile business.

Fred Nichols has been appointed assistant sales manager for the Chalmers Motor Co., of Detroit. Previously he was connected with the Chalmers agency in Boston.

George H. Phelps, manager of the Studebaker Corporation's retail branch in Boston, has been promoted to the post of manager of the New York branch. He succeeds Charles F. Redden, who half-resigned.

For the second time, Ralph Estep, long the advertising manager for the Packard Motor Car Co., of Detroit, has resigned that office. Estep's first resignation was tendered about a year ago, but he then reconsidered it and returned to duty, but this time he is out "for good."

Gilbert J. Loomis, for five years sales manager for the Speedway Motor Car Co., of Dayton, O., has resigned that office, his resignation becoming effective August 1st. It is his purpose to devote himself to the development of an automobile specialty in which he has been interested for some time.

C. F. Young has been appointed assistant general manager of the Regal Motor Car Co., of Detroit. Young enjoyed experience with the Electric Vehicle, Pope and American Locomotive companies, but latterly he has been a member of the engineering and designing staff of the Lozier Motor Co., in Detroit.

After having served the Maxwell-Briscoe Motor Co. and its successor, the United States Motor Co., for eight years, B. E. Stimson has resigned the management of the United Motor Minneapolis Co. His brother, E. B. Stimson, assistant manager, resigned with him. The management of the establishment has been taken over by O. W. Klose.

J. A. Graham has been appointed manager of the Studebaker branch in Minneapolis. He succeeds to the vacancy caused by the resignation of C. R. Newby. Orrin S. Wilson, manager of the Studebaker's Denver branch, has been appointed manager of the big corporation's Des Moines establishment, succeeding C. F. Stewart, who resigned, the vacancy in Denver being filled by the promotion of J. C. Beck, assistant manager. All of the men have been identified with the Studebaker interests for several years.

Martin Forms Indiana Tractor Company.

Growing out of the recent visit of C. H. Martin to Indianapolis, there has been organized in that city the Martin Tractor Co., which has been incorporated under the laws of Indiana with an authorized capital of $350,000. In addition to Martin, the directors of the new company are Hugh R. Richards, F. B. Davenport, Edward D. Moon and George D. Thornton. Their purpose is to manufacture in quantities the Martin three-wheel tractor, which at present is produced under a shop license by the Knox Automobile Co., of Springfield, Mass. The Indianapolis company has not yet secured a factory, but it is stated that several buildings are under consideration.

Corbin Takes Over Brown Speedometer.

Having for some time manufactured the Brown speedometer for the New York company of that name, the Corbin Screw Corporation, of New Britain, Conn., has taken over that instrument and hereafter will market it directly through its sales staff and branches in New York, Philadelphia, Chicago and San Francisco. Henceforth it will be styled the Corbin-Brown speedometer, and Col. W. C. Brown, the inventor, will serve as sales manager of the Corbin corporation's new speedometer department. The Corbin-Brown speedometer is of a centrifugal type.

R. C. H. Establishes Branch in 'Frisco.

To better handle its increasing business on the Pacific Coast, the R. C. H. Corporation is this week establishing a branch and service station in San Francisco. It is located in a three-story structure on Ellis avenue, near Van Ness, which is in the heart of the new automobile district in that city. It will be used as a distributing point for the entire West, it being the intention to have on hand at all times a sufficient supply of R. C. H. cars and to take care of rush orders.

Timken Denies Purchase of Detroit Site.

Someone in Toledo, O., must be possessed of a fertile imagination, for although it was printed in bold, black type that the Timken-Detroit Axle Co. had acquired a site of several acres in that city, the exact location of which was given, the Timken people state that they have done nothing of the sort. They not only have acquired no property in Toledo, but have no intention of establishing a plant there. They are, however, very considerably enlarging their Detroit factory.

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THE MOTOR WORLD

PUBLISHED EVERY THURSDAY BY

The Motor World Publishing Company
1600 BROADWAY, NEW YORK, N. Y.

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CHICAGO, 1441 Monadnock Block
J. FRANK GILMORE

Subscription, Per Annum (Postage Paid) $2.00
Single Copies (Postage Paid) . . . . . 10 Cents
Foreign and Canadian Subscriptions $3.00
Invariably in Advance.

Postage Stamps will be accepted in payment for subscriptions. Checks, Drafts and Money Orders should be made payable to The Motor World Publishing Co.

Change of advertisements is not guaranteed unless copy therefor is in hand on SATURDAY preceding the date of publication.

Contributions concerning any subject of automobile interest are invited and, if acceptable, will be paid for; or, if unavailable, will be returned provided they are accompanied by return postage.

Cable Address, "MOTORWORLD," NEW YORK.

Entered as second-class matter at the New York Post Office, November, 1900.

NEW YORK, JULY 4, 1912

PERMANENT HIGHWAYS AND ONE THAT EXISTS.

It is to be hoped that the campaign inaugurated in Bridgeport, Conn., for the construction of a brick or wood block or other permanent roadway from New Haven to the New York State line will meet with the measure of encouragement and support which it so richly deserves, and that the seed sown will spread to the furthermost parts.

Probably no main road is more extensively traveled than that which lies between New York and New Haven, and probably none is so usually in a more indifferent condition. At various times and in various parts the macadam has been laid and relaid and patched and repatched, but always the road returns to its indifferent state, making plain what has long been apparent, and what the Bridgeport campaigners are emphasizing, i. e., that macadam as a road surface has had its day. Why those entrusted with the construction and upkeep of highways refuse to recognize and admit the fact is beyond comprehension. For certainly latter-day experience abundantly has proven macadam to be a mere stop-gap and money-waster. The fact never was better illustrated than in New York City itself, where for years the authorities have resurfaced parkways and other highways time and again only to have them go to ruin; yet the resurfacing continues, and today one of the most frequently and most recently resurfaced thoroughfares, Riverside Drive, in certain parts closely resembles a plowed field.

On the other hand, and on the New York-New Haven-Boston highway, there has existed for many years on the outskirts of Portchester, N. Y., a stretch of permanent highway which cannot but serve as an object lesson for all who are not beyond acquiring knowledge. It well may be doubted whether brick will prove a satisfactory road surface, but whether brick or wood blocks, it is undoubted that the unit form of construction which they entail cannot but prove so expensive as to at least give pause to those who consider their use. But the Portchester pavement, whatever it may be, apparently a "poured" pavement, resembling asphalt, if its uniformly smooth condition and its apparent resistance to wear and tear for over-long periods, may be accepted as a criterion, offers an answer, if not the answer, to all who seek a really permanent highway. While other roads in all directions have gone to decay, only to be renewed and to decay again, the Portchester pavement has remained hard, smooth, clean, dustless and rutless—an object lesson for all.

HOT WEATHER'S EFFECTS ON TRUCK PERFORMANCES.

The rising temperature of summer brings with it a peculiar condition which, while in some degree affecting gasolene trucks, is much more keenly felt by users of heavy electric vehicles. As a direct result of the softening of the asphalt of the city streets the truck tires sink deep in the yielding stuff and the progress of a heavily loaded vehicle is the equivalent of a continuous hill-climb.

While the most conspicuous result is a very considerable increase in the consumption of electricity or of gasolene, as the case may be, there necessarily must follow the general wear and tear of a long hill-climb. The current consumption phase of the matter is the most troublesome, however, for in the case of an electric vehicle having to cover a distance that necessitates the use of the entire normal output of the battery in cool weather, the additional draw in hot weather is a cause for worry because it may, and often does, cause exhaustion of the battery before the end of the trip.

Obviously the best thing to do would be to go to the root of the trouble and build roads less sensitive to heat. As this seems impossible, or at least impracticable at present, the only alternative to letting matters go as they are is to increase the bearing surface of the tire on the ground. Tires on heavy trucks usually are made about as wide as is practicable, so there remains the expedient of increasing the wheel diameter, which is open to two objections: it necessitates a greater ratio of reduction in the gearing and it means added expense for wheels and tires. In the earlier days of motor car construction the comparative crudity of gear work made it necessary to keep the road wheel diameter as small as possible in order to minimize gearing difficulties. With the highly efficient gearing that now is available, however, to say nothing of worm drive systems, the reduction problem is by no means so serious, and the added expense of the larger tires would be largely, if not entirely, offset by the added mileage due to the added wearing surface. There would be a saving in power and in wear that would amount to a considerable figure during the life of the car. Large wheels are easy riding, and while the question of luxury does not enter into commercial vehicle problems, the question of crystalization does, and lack of vibration means delayed crystalization. Makers of gasolene cars have done far more work with large diameter wheels than have electric truck builders, with satisfactory results; and there seems to be no important reason, save that of first cost, why makers of heavy battery trucks should not turn their attention in this direction.

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HAYNES HOST AT "HOUSE PARTY"

Managers, Dealers and Others Attend Three-Day Function at Kokomo Factory—Instruction Mixed With Fun.

The latest product of the Haynes Automobile Co., of Kokomo, Ind., was not a motor car—though, of course, motor cars figured conspicuously in it—but a three-days "House Party" that was intended to make Haynes agents and managers and parts and material men and press men, who were the guests of the occasion, better acquainted with the Haynes "house," the Haynes hosts, the Haynes product and with each other.

Each of the three days—June 25, 26 and 27—had its particular features of interest, but perhaps the most original, not to say startling, event was the opening performance, so to speak, of the second day, which was designated as "Mechanical Day." This was the "construction of a complete motor car while you wait," with all the details and adjustments explained by Chief Engineer Frank Nutt and Superintendent Zehring. Other days were by no means lacking in interest, however. From the opening of the first session at "headquarters," when C. B. Warren, general manager of the Haynes company, explained "The House Party and Its Objects," to the final winding-up banquet at the Y. M. C. A. on the evening of the third day, there was something going on all the time; the sessions were held at "Headquarters," at the factory and at the Y. M. C. A. assembly hall, and each of the guests and each of the hosts was called upon for a ten-minute talk, each man being assigned a subject that he was especially happy in dealing with. When General Manager Warren had started the ball rolling by explaining what it was all about, Elwood Haynes, whose remembrance of things pertaining to the early history of motor cars is of an encyclopaedic nature, largely because he himself helped to make that history, talked about his "Recollections," and during the course of the feast of wit and flow of soul—not to mention various occasions when more substantial things were in evidence—there were talks on a wide range of motor car subjects, running all the way from advertising to ignition, and from steel to selling. There was certainly no lack of appropriateness in the assignment given to Steelman, of the Terre Haute Malleable & Mfg. Co., who talked about steel castings. Dr. Stanley F. Krebs was called upon on three occasions, discoursing on "His Honor, the Other Fellow; how to read and handle different types and kinds of human nature," "The Sale Hill, and how to get the customer to the top of it," and "Two Snakes in Eden; the conquest of fear and worry in business."

A banquet at which the honors were done by Elwood Haynes, Conrad Wolfe, the Haynes company's attorney, as toastmaster; J. W. Johnson, A. E. Starbuck, Dr. Stanley Krebs, and A. L. Thalman as official story-teller brought the "House Party" to a happy conclusion. Between sixty and seventy ten-minute talks were listed in the artistic little programs that were printed for the occasion, and though not all of those invited were able to attend the affair, there were plenty to make the occasion one not soon to be forgotten.

May Responsible for Slight Import Gain.

Official statistics show that during the month of May the importation of automobiles into the United States increased one in number and $7,713 in valuation as compared with the same month of the preceding year—76 as against 75, their sources of values being as follows:

	May, 1911.		May, 1912.	
	No.	Value.	No.	Value.
Imported from—				
United Kingdom	19	$36,941	11	$28,324
France	26	62,442	41	95,965
Germany	13	26,460	5	10,114
Italy	7	12,799	11	17,424
Other countries	10	19,404	8	13,932
Total cars	75	$158,046	76	$165,759
Parts of		47,846		21,493
Total cars and parts.		$205,892		$187,252

The imports of parts fell from $47,846 in May, 1911, to $21,493 in that month of this year, a loss of 55 per cent. Statistics for the eleven month period ending with May show that 921 cars, valued at $2,033,254, were imported, as compared with 771 cars, valued at $1,642,329 for the eleven months ending May, 1911, a gain of slightly less than 20 per cent. in number and 18 per cent. in valuation. The parts imported during the eleven months ending May, 1912, were valued at $283,736, and at $336,168 for the eleven month period terminating with May, 1911, a loss of 15 per cent.

No Let-up in Exportation of Engines.

Although the absence of earlier statistics makes impossible a comparison of 1912 automobile engine exports with those of preceding years, the numbers of engines exported during May, 1912—571—is within five of the monthly average for the 11 months ending May, 1912, during which period 6,344 were shipped out of this country. The May shipments totaled $67,627, an average of $118 per motor, while the 11 months' valuation, $726,280, gives an average of $114.

Clark Settles Troubles and Resumes.

Although the Citizens' Industrial Association of Shelbyville, Ind., filed suit against the Clark Motor Car Co., of that city, for liquidating damages and foreclosure of mortgage, the much-troubled company apparently has found a way out of its many difficulties, which led to the filing of an involuntary petition in bankruptcy in February last. At any rate, after several suits had been settled the plant was reopened last week and is again in operation without change of officers or stockholders.



July 4, Davenport, Ia.—Davenport Automobile Club's annual hill climb on Rock Island hill.

July 4, Macomb, Ill.—Track races on the fair grounds track.

July 4, Los Angeles, Cal.—Mt. Washington Automobile Association hill climb on Mt. Washington hill.

July 4, Wildwood, N. J.—Straightaway races, under the auspices of the North Wildwood Auto Club.

July 4-5, Butte, Mont.—Track races under the auspices of the Butte Motor Club.

July 4-5, Tayor, Tex.—Track races under the auspices of the Taylor Automobile Club.

July 4-6, Old Orchard, Me.—Beach races under the auspices of the Old Orchard Automobile Association.

July 5-6, Tacoma, Wash.—Road races under the auspices of the Montamara Festo Automobile Commission.

July 7, Fort Wayne, Ind.—Track races promoted by E. A. Moross.

July 13, Forestville, N. Y.—Hill climb under the auspices of the Forestville Motor Club.

July 15-16, Cleveland, Ohio—Reliability run under the auspices of the Cleveland News.

July 15-20, Milwaukee, Wis.—Reliability tour, under the auspices of the Wisconsin State Automobile Association.

July 21, St. Louis, Mo.—Track races under the auspices of the Universal Exposition Co.

July 22, Dallas, Texas—Farm and Ranch Tour under the auspices of the Dallas Automobile Club.

August 8-10, Galveston, Tex.—Beach races under the auspices of the Galveston Automobile Club.

August 23-24, Elgin, Ill.—Chicago Motor Club's national stock chassis road races.

September 2-3, Indianapolis, Ind.—Races on the Motor Speedway, promoted by the Indianapolis Motor Speedway Co.

September 7, Hadine, Minn.—Track races promoted by the Minnesota State Fair Association.

September 17, Milwaukee, Wis.—Grand Prize road race under the auspices of the Milwaukee Automobile Dealers' Association.

September 21, Milwaukee, Wis.—Vanderbilt Cup race on the Greenfield course, under the auspices of the Milwaukee Automobile Dealers' Association.

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EASTERN SPEEDWAY TAKING SHAPE

Metropolitan Association Finally Elects Officers and Employs Engineers—Outline of Plans for Huge Enterprise.

After apparently lying dormant for several months, the Metropolitan Motor Speedway Association suddenly has awakened almost full-grown. It has been incorporated with an authorized capital of $1,500,000, officers have been elected and offices established, one in New York City and the other in Newark, N. J., and all other plans seem to be well in hand. Indeed, the projectors are so sanguine that their plans to accomplish the gigantic task of converting the expanse of swampland lying between Jersey City and Newark, N. J., into a modern speedway and motordrome will be completed, that they have selected July 4, 1913, as the date for the opening event—an international 500-mile race.

The officers of the association are: President, H. E. Hoyt, who is vice-president of the American Potash Co.; vice-president and general manager, A. R. Pardington, former manager of the Long Island Motor Parkway; treasurer, Theodore F. Keer, who is vice-president of the Newark Trust Co., and secretary, W. H. Osborne, who is secretary of the Commercial Maintenance & Motor Co. Fred J. Wagner, the A. A. A. starter and race promoter, is one of the directors, and with Pardington will direct and oversee most of the actual work of preparation; and as these men have had large experience the work may be said to be uncommonly well in hand.

A New York city office has been opened in the United States Rubber Building, 1784 Broadway, where Pardington will make his headquarters. The engineering staff, however, will be quartered in Newark in the Ordway Building, 207 Market street.

It is expected that ground will be broken, or, more correctly, land will be dumped into the marshland during the present month and that the speedway will be completed within one year.

While the promotion of automobile races is the underlying basis of the project, it is the intention to so design the speedway that the plant will be available for all manner of outdoor contests and exhibitions. The track proper will be a brick oval, two miles in circumference, 60 feet wide, except on the turns, which will be 75 feet in width, and scientifically banked, of course. The infield will be laid out to permit the holding of aviation meets, baseball, football and field and track athletics generally, also circuses, Wild West shows and the like.

According to present plans, automobile races will be run fortnightly, provision having been made for an elaborate lighting system. Grandstands, with boxes and promenade seats, with a seating capacity of 200,000, will be erected the entire length of the straightaway stretches, and parking accommodations for 10,000 cars will be arranged in the infield, which will be accessible by three double-track tunnels. Garages, repair and machine shops, pits, a hotel and club house, and a restaurant are among the things which are included in the huge plans; and as the total population within a radius of 20 miles is 7,000,000 the projectors have a rich and a big field from which to draw.

The Speedway location is within 12 minutes of downtown New York by means of the Hudson tubes. The Erie, Pennsylvania, and D., L. & W. railroads each will have stations on the property, permitting patrons to pass directly from the trains to the grandstands. The Public Service Corporation of New Jersey lands passengers on two sides of the property, with a five-cent fare from Newark and Jersey City. From New York the fare is 10 cents. Boulevards from Jersey City, Hoboken, Weehawken and interior New Jersey lead to the property. Ferries from 130th street, 42d street. 23d street, Christopher, Desbrosses, Cortlandt and Barclay streets have an automobile capacity of 3,000 cars per hour. The Speedway is convenient to all points in New Jersey by rail, trolley and highway, and by automobile and train from Philadelphia, Trenton, the Oranges, and all points within 200 miles.

Weight Decides Cincinnati's Fuel Contest.

Perhaps if a severe thunder storm had not overtaken the 26 contenders in the Cincinnati Automobile Club's efficiency or fuel consumption contest, which occurred on Saturday last, June 29th, their scores might have been better; certainly the going would have been pleasanter. As it was, however, Horace Heisey, driving a Buick, covered the 41 miles from Cincinnati to Hamilton, O., and return with a consumption of but 1.32 gallons of fuel, which is "considerable economy," but not quite so good as the record of E. J. Carpenter in a Franklin, who consumed but 1.30 gallons. As Carpenter's car weighed 2,960 pounds, however, as against 2,835 pounds for Heisey's Buick, the formula which applied gave first honors to the latter. Third place went to J. A. Duchemin, who drove a Selden and who completed the course with an expenditure of 2.07 gallons of fuel, his car weighing 4,420 pounds. The formula which decided the standing of the contestants required that weight of the car be divided by the quantity of gasolene used, thus fixing the ratio of the quantity of fuel consumed to the net weight of the vehicle.

Watertown Forms Automobile Club.

At a meeting which resulted in the formation of the Watertown (Wis.) Motor Club, the following were elected to office: President, A. R. Barker; vice-president, Dr. A. W. Meyer; secretary, Max Kusel; treasurer, Max Rohr.

BURMAN REGAINS "MEAL TICKET"

Menenghetti Holds Remy Prize Only One Week—Burman Has Two Big Days on Laurel Track.

Louis Menenghetti, who only the week previously had defeated Robert Burman in five out of six heats which were run for the Remy Brassard and trophy, passed the "meal ticket" back to the gentleman of Blitzen Benz fame when three heats for the trophy were contested on Friday and Saturday last, June 27th and 28th, on the one-mile track at Laurel, Md. That the act was not voluntary, however, was generally guessed by the spectators who were within earshot when the Cuban—for Menenghetti proves to be a Cuban and not an Italian—discovered that the crankshaft of his Mercedes had parted, which put him out of the running in the first heat, which the promoter, R. E. Shadel, had programmed for the first day of the racemeet.

Burman also took first place in two Class E events which were included in the first day's program; the shorter of the two, which went for five miles, he completed in 5:22, driving the Cutting; the second, which went for 25 miles, he completed in 27:32, likewise in the Cutting, his victory giving him the Matoline trophy. His performances for the first day of the meet ended when he drove an exhibition mile in the Benz in :58¾, establishing the local track record. The three remaining events which were embraced by the program of Friday included two Class C events for cars of 161-230 and 231-300 inches displacement, respectively, both of which went for five miles, and a five-mile free-for-all handicap, and were respectively won by I. C. Barber, who drove a Warren and finished in 6:15; John Raimey, who completed the course in an Ohio car in 5:37, and E. A. McDonald, who won in 6:19½.

The chief interest on Saturday centered in the Australian pursuit, in which Burman passed in succession John Raimey in an Ohio, I. C. Barber in a Warren and Campbell in a National, the pursuit lasting for more than eight and a half miles. Burman's time in the Benz was 8:19¼. Burman also came to the front in a five-mile Class E event, in which five contenders started and which was completed in 5:34. Raimey in the Ohio was second, following Burman's Cutting car across the tape 19 seconds later. The five-mile free-for-all handicap attracted its full share of attention and was won by McDonald, who started from scratch and finished in 6:05½. Barber in the Warren, who started 55 seconds ahead of the winner, took second position.

Barber won the Class E, 161-230 inches event, which went for five miles with three contenders, and completed the distance in 6:07¾ in a Warren. A five-mile Class E event and a five-mile special event went to

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Raimey in the Ohio and Blair in the Mercer, respectively. Raimey's time was 5:55, while Blair needed 6:04½ to cover the same distance. An exhibition mile which Burman drove in 54¼, lowering the record made on the first day of the meet by 4½ seconds, completed the program. The summary:

Friday, June 28th.

Three miles, for the Remy Brassard and trophy, first heat—Won by Robert Burman (Benz); second, E. A. McDonald (Benz); third, I. C. Barber (Warren). Time, 3:20.

Twenty-five miles, Class E, for cars with piston displacements not over 600 inches—Won by Robert Burman (Cutting); second, John Raimey (Ohio); third, Howard W. French (Lozier). Time, 27:32.

Five miles, Class C, cars with displacements of 161-230 inches—Won by I. C. Barber (Warren); second, Frank G. Stewart (Reo). Time, 6:15.

Five miles, Class C, cars with displacements of 231-300 inches—Won by John Raimey (Ohio); second, C. C. Fairman (Kline). Time, 5:37.

Five miles, Class C, cars with displacements of 451-600 inches—Won by Robert Burman (Cutting); second, J. W. Minker (Kline); third, H. W. French (Lozier). Time, 5:22.

Five miles, free-for-all handicap—Won by E. A. McDonald (Benz); second, C. C. Fairman (Kline); third, H. W. French (Lozier). Time, 5:14½.

Saturday, June 29th.

Five miles, for cars of 161-230 inches displacement—Won by I. C. Barber (Warren); second, Stewart (Reo); third, Blair (Warren). Time, 6:07⅜.

Five miles, Class E, for cars under 450 inches displacement—Won by John Raimey (Ohio); second, I. C. Barber (Warren); third, Blair (Mercer). Time, 5:55.

Five miles, special—Won by Blair (Mercer); second, I. C. Barber (Warren); third, Stewart (Reo). Time, 6:04½.

Three miles, second heat for Remy Brassard and trophy—Won by E. A. McDonald (Benz); second, Robert Burman (Benz). Time, 3:11¼. Final heat—Won by Robert Burman (Benz); second, E. A. McDonald (Benz); third, Menenghetti (Mercedes).

Five miles, Class E, for cars under 600 inches displacement—Won by Robert Burman (Benz); second, John Raimey (Ohio); third, I. C. Barber (Warren); fourth, Blair, (Mercer). Time, 5:34.

One mile, time trial—Robert Burman (Benz). Time, 54¼.

Five miles, free-for-all handicap—Won by E. A. McDonald (Benz), from scratch; second, I. C. Barber (Warren), 55 seconds handicap; third, John Raimey (Ohio), 20 seconds handicap); fourth, Campbell (National), 25 seconds handicap. Time, 6:05½.

Eight and one-half miles, Australian pursuit race—Won by Robert Burman (Benz); second, John Raimey (Ohio); third, I. C. Barber (Warren); fourth, Campbell (National). Time, 8:19¼.

A. A. A. REPRESENTATIVE RESIGNS

Others Suspended for Defiance of Orders in Santa Monica Road Race—New Rule is Promulgated.

Because of the remarkable situation which developed in connection with the Santa Monica road race on May 4th last, in which, despite repeated and emphatic instructions, two so-called Flanders cars were permitted to compete, although equipped with special motors, and the following day were permitted to figure in track events at Los Angeles as "E-M-F" cars, the A. A. A. contest board very graciously has "unanimously decided to accept the resignation" of E. G. Kuster as the official representative of the A. A. A. contest board in Southern California.

Not quite so graciously, the board has declared ineligible for official appointment in any capacity until January 1st next R. P. Hillman, of Los Angeles, who refereed the road race, and has disqualified A. M. Young, of Los Angeles, the promoter of both the road race and the track meet, for a similar period. This awful punishment will enable the flagrantly disobedient and defiant referee and promoter to be ready for duty before the next Santa Monica race comes to pass.

"In view of the extenuating circumstances, due apparently to a conflict in authority in the interpretation of the contest rules," according to the official statement, "it was decided to approve the awards as made by the referees in these two contests, but that in future events sanctioned by the contest board the nomenclature of special cars must be clearly defined."

The times made in the Santa Monica race will not be recognized, as the A. A. A. has failed to obtain possession of the original timing record.

Growing out of the Santa Monica trouble, the A. A. A. contest board has adopted and promulgated the following rule, which is designed to prevent similar proceedings:

"No car with a bore, stroke and piston displacement of a different size from the regularly catalogued product of a manufacturer shall be entered in any sanctioned event until its manufacturer shall have blanks provided for the purpose by the contest board, sworn certificates giving the bore, stroke, number of cylinders, total piston displacement, horsepower, and year and model name of the cars, and such cars must be officially entered, programmed and advertised in strict accordance with such registration. All other cars must be entered, programmed and advertised in strict accordance with catalogued specifications."

The A. A. A. also has made more specific regulations concerning repair pits for road races by promulgating Rule 113, which requires that "there shall be located at the start and finish line one repair pit for each car started, not less than 15 feet long and 8 feet wide. The pits must be located on the right of the course in the direction in which cars are traveling. If located on the same side and in front of the grandstand, there must be an intervening distance of not less than 15 feet between the pits and the stand."

Gilbert Wins Speed Judgment Contest.

Of the 36 members of the Springfield (Mass.) Automobile Club who on Thursday last, June 27th, participated in its sixth annual speed judgment contest over a 21½ mile course to Forest Lake, T. B. Gilbert proved that he was able to obey the "know thy pace" admonition. He most closely followed the rules laid down to drive at a 12-mile rate for the first 25 minutes of the run, at a 20-mile rate for the next 42 minutes and then to continue the journey at 12 miles an hour, and by so doing he won the Fisk trophy. Gilbert in his Maxwell arrived at Forest Lake just 16 seconds later than he should have done had the rules been followed to the letter; Walter S. Barr, who drove a Chalmers, and Henry Clave, in a Stearns, won second and third honors, respectively. The prizes which were awarded, of which there were 20, embraced everything in the accessory line from a Klaxonette to an inner tube, but each prize was useful and pertinent. Various athletic games were indulged in by the club members through the afternoon, and for the winner of each of these contests there was a prize.

New York's "Motor Carnival" is Off.

The motor carnival, which was to have been a feature of the New York Hotel Men's League's summer-long festival, is off—at least, until September next. It was due to occur during the present month, but late last week the astonishing discovery was made that at this time the "automobile business is at a low ebb and so many motorists and people connected with the trade are on vacations, and so few dealers have 1913 models ready for delivery," that prospect of a successful carnival is so indistinct as to be painfully visible. The proposed carnival aroused little, if any, enthusiasm, but, nevertheless, September 9th to 14th have been set as the dates for a new trial.

Tour Becomes "Boost Denver" Affair.

Ten motor car loads of Denverites, out to "boost" their home town, are now on a tour from that city to Chicago and return, the event being what remains of the Denver Chamber of Commerce's proposed contest from Denver to New York City and back, which was launched with considerable eclat but which was curtailed because of lack of entrants. The contest feature also was eliminated. The "boosters" left Denver June 25 and the schedule calls for seven days en route to the Windy City, three days tarrying in that town and nine days on the way back to the Colorado capital, making nineteen days' absence from home.

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THE LOG OF THE AUTOMOBILE ENGINEERS' CRUISE

The Work That Was Done During the Three-Day "Terra-Marine" Mid-Summer Meeting of the S. A. E. and the Hilarious Play That Relieved the Monotony of More or Less "Dry" Professional Sessions—Detroit Convention and a Similar Outing Likely Next Year.



ONE OF THE MANY SIMILAR WELCOMING BANNERS THAT FLUTTERED IN DETROIT LAST WEEK

Just as exploration naturally follows discovery, so has exploration of the work which has been done in the past year by the Society of Automobile Engineers followed the "discovery" of the society by its members at the summer meeting held in Dayton, O., in June, 1911. Some 400 members of the society gathered in Detroit, Mich., on Thursday last and during the two days which followed and which were spent on the reaches of Lake Huron, the delving into past performances and the exploration of records that was made was thorough enough to reveal that the S. A. E. has become more than ever a factor that must not only be reckoned with in the solution of the multiplicity of problems that arise to harass or encourage the manufacturer, but one that has become well-nigh indispensable.

One of the principal things which the convention served to emphasize is the avidity with which engineers turn to the society with their problems and the solutions of problems that at one time or another have proven knotty. At the annual meeting which was held in New York City last January, in conjunction with the national shows, this feature was not so apparent, probably because manufacturers and designers and engineers were more concerned with problems involving the disposal of their outputs for the coming season than they were with engineering troubles. During Thursday and Friday and Saturday last week, however, conditions were entirely different. For the nonce, selling policy and selling plan were relegated to the background—insofar as that was possible, for it undoubtedly is true that manufacturing, with the feature of cost ever paramount, bears directly on selling policy—and those who foregathered concerned themselves more directly with matters pertaining to engineering.

Not even the fact that the professional sessions were held "far from the madding crowd" out on the heaving bosom of Lake Huron, served to detract attention from the business in hand. In this connection, however the use of the word heaving is a misnomer. There was not even a single heave, to cause, as President Donaldson said, "sympathetic heavings." The air was singularly clear and still and the only ruffles that marred the lake in the immediate vicinity of the good ship City of Detroit II, on which the engineers were, figuratively speaking, held prisoners, were those caused by the ship's own paddle wheels. During the two days the weather was as nearly ideal as it is possible ever to obtain. It is said that the efforts of the Detroit committee on entertainment were responsible for the climatic conditions, nor is the allegation denied by the committee itself. Be that as it may, neither old J. P., nor Neptune, or whoever the deity who presides over the usually troubled waters of the Great Lakes, conspired to interfere with either business, of which there was much, or pleasure, of which there probably was more. However, business came always before pleasure, and though there were those who inclined to let the latter interfere with the former, as was evidenced by sundry poker games in the smoking room on the ship and sundry other "social" gatherings on the broad decks while the professional sessions were in progress, the meetings were well attended on the whole, though little that was either illuminating or highly instructive was brought out during the discussion of the various papers that were read.

Officially, the summer convention was opened in the Convention Hall of the Hotel

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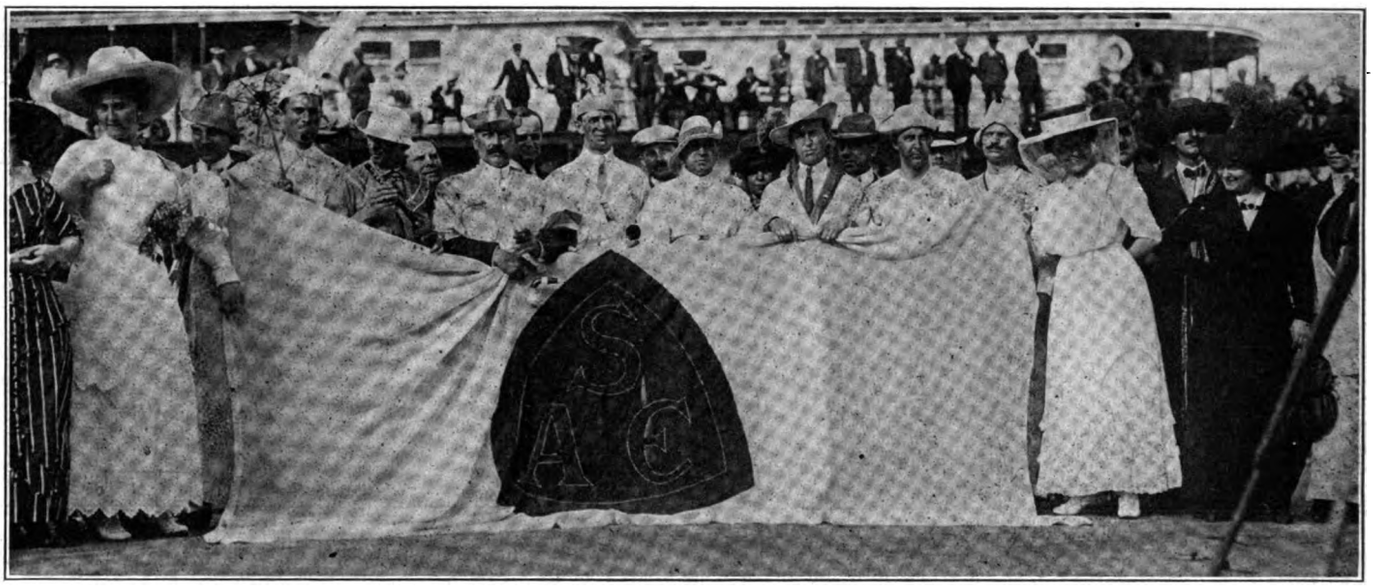
Pontchartrain on Wednesday morning, 26th ult., with a meeting of the Standards Committee, at which some 50 committeemen were present, and at which the work of the various divisions during the past year was reviewed and reports were gotten in shape for presentation at the formal society meetings. It was not until the following morning, however, that the convention really opened, and by 10 o'clock in the morning the Convention Hall was well filled. President Donaldson opened the session with his presidential address, in which he reviewed briefly the activities of the society in the past year. As always has been the case, the work of standardization which is being actively pushed and which at present has reached to a significance that is appreciated by few who are not intimately connected with the movement, formed the basis for a goodly portion of his address. In conclusion he raised a laugh and hearty applause by referring to the standardization work in the terms of the old and well-known proverb anent eating a pudding to discover its particular delights. "An old proverb says," he informed his hearers, "that the results of the pudding are in the chewing of the pudding string; and so while the mastication of the string has occupied the exclusive attention of some, others already have digested the standardization plums and appear to be well fed and happy."

Standardization, in fact, was one of the themes which was well defined in the general harmony which prevailed at the meetings. It was always cropping up in unexpected places during discussion. Nearly every one referred to it at one time or another, and on more than one occasion the work was made the butt for witticisms. Such "funnings," however, were merely in the nature of safety valves to relieve the excess of good humor that prevailed and leave minds cleared for a better conception of the question.

The antagonism against standardization which exists in the minds of some men still persists, though its pointedness has been partially blunted during the past year, probably because of the good work that has been done and the benefits which even now are accruing. The contrary view was well reflected in the remarks of Lord Montagu, who as a leading British authority with a peculiar familiarity with conditions "on the other side," addressed the meeting in Detroit at the request of President Donaldson. There was a tendency, he said, for standardization, unless carefully carried out along well defined lines, to damp out the enthusiasm of invention. Standardization should not be pressed too far if healthy competition was to be fostered. This was particularly the case at present in view of the growing international character which the automobile industry is assuming. Such standards as were adopted should be scrutinized with a view to determining their applicability to foreign as well as American practice, emphasis being laid on the necessity for providing uniform tire and wheel sizes. Standardization in England was progressing, though with none of the speed that has marked the movement in America. In conclusion, he remarked what is obvious, i. e., that standardization cannot possibly be attained for a number of years, which statement he backed up by citing the condition of the locomotive industry, which, though in the course of standardization for 30 years or more, still was far from its ultimate development.

In replying to Lord Montagu, Henry Souther, past president of the society and at present chairman of the Standards Committee, reiterated the statement that standardization means not necessarily revolution but a gradual readjustment. Standard, he said, means approved construction, and is not the result of one man's experience but of many. As regards the damping of inventive enthusiasm, he remarked that if it could be proven that square wheels were better for commercial vehicles, square wheels would be used in spite of all the standardization work which the S. A. E. might accomplish, for, he concluded, "Mr. Montagu, you cannot down the Yankee inventor."

Immediately following the addresses by Messrs. Souther and Montagu, the routine business of the meeting was taken up. Not the least important fact that was brought out was that since the last summer meeting the membership of the society has increased some 60 per cent., the total enrollment at present being 1,300. The increase represents the election of 206 members, associates, juniors and affiliates since January, 1912. The treasurer's report which followed revealed that the balance on hand as a result of the past six months' activities amounts to upward of $3,000.



S. A. E. KIMONO CORPS DISPLAYS THE OFFICIAL BANNER TO WONDERING NATIVES

It goes without saying that during the time the engineers were in Detroit, the city was thrown wide open for their benefit. Practically all of the many automobile factories in the city, and there are 40 of them by actual count, invited inspection of their plants, though owing to the short amount of time between the adjournment of the meeting on Thursday and the sailing of the society's floating headquarters, the Ford plant was the only one which could be visited. As a matter of fact, the visit had been arranged beforehand and special trolley cars were provided to convey the delegation to the factory. Arrived, there was not a locked door in the whole plant, and members were permitted to wander at will through the maze of automatic machinery and gaze in wonder while some 325 automobiles were turned out under their very eyes. During the time the inspection of the Ford plant was in progress, the ladies of the party, 80 or 100 strong, were entertained by the Detroit Board of Commerce. An

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automobile trip occupied part of the morning and afternoon, and later a theater party was the order.

The first night on the ship was a wild one for many. The ladies of the party retired early, but the men, staid presidents of companies, consulting engineers, and other high dignitaries and officials, made merry far into the night. They paraded around the decks and saloons in lock step singing, "Hail, hail, the gang's all here;" they instituted "rough house" proceedings that would have done justice to a gathering of college freshmen; and altogether they had a glorious and uproarous time. Fun and unful place, half rolling country and half flat. Strangely enough automobiles are absolutely foreign to its shores; their use is prohibited. As a consequence, it is probable that there are more horses and carriages to the square inch. so to speak, than in any other locality.

It was after dinner on board that the exhuberance of spirits became apparent. Headed by Albert Champion, F. E. Moskovics, and a few other choice spirits, a party of perhaps thirty diversion seekers marched into town singing at the tops of their lungs and proceeded to load up with tin whistles, toy drums, zoboes and other Champion's example, donned wrappers, brightly colored kimonas, and even plain white petticoats. All were topped off with sun bonnets, immense straw hats, Indian head gear and grass hats, and if the natives of the erstwhile quiet little town of Mackinac viewed the parades and speeches and songs which followed, as the ravings of a crowd of escaped lunatics, it is small wonder. Later, the appearance of one of the number in a blanket, with a bow and arrows, caused another general change in fashions, and it was not long before the whole crowd, which increased in size as the time for sailing approached, took on the



"POCAHONTAS" AND THE "INDIANS" GROUPED ABOUT PRESIDENT DONALDSON, SECRETARY CLARKSON, EX-PRESIDENTS COFFIN AND SOUTHER AND OTHER S. A. E. OFFICIALS IN THE BOW OF THE SHIP

limited joy were the order of proceedings and as it was a "private party," none other than S. A. E. members and their wives being permitted on the ship, which was charered for the occasion, there was no one to put a damper on the ardor of the pleasure seekers.

But the "high jinks" that were instituted the first night were merely forerunners of what was to take place the following day at Mackinac Island and during Friday night. It is safe to say that the inhabitants of Mackinac Island never have seen a greater "hurrah" than that which was given when after a night and a day on shipboard the noisy faction of the delegation went ashore to stretch its legs and to find fresh diversion.

The Island of Mackinac itself is a beautinoise producing instruments. With these they serenaded the principal hotels and created an infernal din. The novelty of such accoutrements having worn off, some one in the party disappeared into a dry goods store and reappeared arrayed in a long white night shirt (over his clothes, of course). Needless to say he made an almost instant hit with the others, who immediately proceeded to "go and do likewise." But there were not enough sleeping garments to go the rounds, and Albert Champion, who really was the leading spirit in all the doings, compromised on a resplendently colored lady's wrapper, a string of immense beads and a poke bonnet. Soon all the rest discarded other more or less intimate garments which covered their ordinary clothing and following appearance of a band of Indians on the war path. Not even the war paint was missing, and at last reports some of the "Indians" were endeavoring to remove a too liberal application of indelible pencil. On board ship, activities were continued, sporadic parades around the saloons being the order, and it was along in the "wee sma' hours" before seriously minded persons could get to sleep.

The following day, just before a stop was made at Port Huron, the "Indians" donned their war paint and fineries for the benefit of the photographer, and were pictured in groups and singly on deck. Needless to say, they went ashore togged out as they were, though probably owing to the daylight, activities were of a less spectacular and vociferous character. Probably a dozen

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"braves," arms, legs and all painted in fierce characters and S. A. E. emblems, shed blankets and feathers and dove overboard to the accompaniment of squeals of delight from the ladies and an admiring circle of small boys. The paint did not wash off.

Everybody, with the possible exception of the members of the ship's crew, whose duty it was to clear away the debris, had a glorious time, and as it was the purpose of the committee in charge of entertainment to see that just that happened, everybody was satisfied. For those who were disinclined to take part in the war dances and other highly diverting antics of what speedily became known as "that noisy bunch," there was deck shuffle board, cards and boxing. As was to be expected, Champion and Moskovics took an active part in the procedings within the "squared circle." They were put on in the principal bout of the tournament, the heavyweight class, and gave an exhibition of sparring which, if not scientific, at least was amusing. Neither has a superabundance of hirsute covering on his cranium and each selected the top of the other's head as the fairest target at which to aim wonderfully executed "uppercuts" and "corkscrews." It is not a matter of record how much weight each lost as a result of the strenuous "milling." Nor is it known who is entitled to the championship, though, as befits his name, Champion quite naturally claims it.

Over all the proceedings, the S. A. E. official banner waved. During the time the ship was under weigh it flew from the bow on the staff which on Sundays and state occasions carries the Union Jack, and when the delegation trooped ashore the banner was taken along as a matter of course and used as an effective foreground for several of the group photographs that were taken. The banner itself was of white silk with the S. A. E. emblem in yellow occupying a blue triangle in the center. The same emblem was emblazoned on a hurriedly constructed kite that three or four of the engineers attempted without success to fly from the hurricane deck.

But, as already has been stated, the two days' cruise was not all pleasure. A goodly amount of real work was done, though owing to the length of the several papers that were read and the rambling discussion that followed them, a considerable portion of the program had perforce to be abandoned. Thus, for instance, the papers by John Wilkinson (The Effect of Relation of Bore and Stroke in Automobile Engines), J. M. Thomas (Stability of Automobile Propeller Shafts), S. I. Fekete (Method of Brake Capacity Determination), and L. J. Lane (Leaf Springs), [all of which were printed in the Motor World last week], held over until the semi-annual meeting in January. Also, the topics which had been suggested for "discussion provided time permitted" had to be omitted.

In view of the importance of Detroit as an automobile manufacturing center, it is altogether probable that the next summer meeting, or part of it at least, will be held there also. It is planned to extend the cruise to include Sault Ste. Marie, in which case the trip will occupy three days instead of two. However, nothing definite has been decided, though invitations from both San Francisco and Indianapolis, the latter being facetiously styled by one member as "the suburbs of Detroit," have been received and will be considered. It is unlikely, however, that either will be accepted, for Detroit has a strong claim on the affections of the engineers and has made overtures for the next convention, which, in view of the success of the one just completed, likely will bear considerable influence.

It was at the first formal gathering on board ship that appreciation of the splendid work that during the past two years had been done by Secretary and General Manager Clarkson found official recognition



MR. AND MRS. SOUTHER AND COFFIN AND COKER CLARKSON AT FORT MACKINAC

in the form of a presentation. For some time past the Indiana section of the S. A. E. has been actively engaged in collecting a fund with which to purchase an automobile which it was planned formally to present to Clarkson during the convention. Unfortunately, though the fund now has reached to proportions that will permit the purchase of a really first-class car, the committee in charge is undecided what brand will be most suitable. In lieu of the actual machine being presented, therefore, Clarkson was notified of the intention of the society to honor him and presented with a miniature limousine, electrically lighted and equipped with a "spring starter," which it was pointed out was built thoroughly in accordance with S. A. E. standards. Clarkson was not the only member of the society to receive a remembrance of the occasion, however. Just before the boat docked at Detroit on the return trip, every member was presented with a small, leather covered, loose-leaf notebook, on the cover of which was embossed the S. A. E. emblem and owner's name in gold.

In the reports that were rendered by the various divisions of the Standards Committee was revealed a small part of the tremendous volume of work that has been done during the past year, most of it under the active guidance of Coker Clarkson. Clarkson's supervision of the work was necessary mainly for the reason that much of that which has been accomplished has been the direct result of mail inquiries, in which the position of manufacturers and designers was ascertained, before the matters formally were laid before committee meetings.

Despite the amount of work that has been done, however, and indicating the spirit of cautiousness with which investigations are being prosecuted and standards recommended, the reports of but three divisions of the Standards Committee were accepted by the S. A. E. as recommended practice. The other reports all were in the nature of progress reports, and as explained by Henry Souther, who is chairman of the committee as a whole, their recommendations still are brewing.

Probably the most important of the three reports which were accepted and ordered printed for insertion in the S. A. E. data book as recommended practice, was the report of the Carburetter Fittings Division, of which G. G. Behn is chairman. In presenting the report, it was explained by Chairman Behn that the division has been working toward standardization of carburetter flange and gasket and pipe connection sizes for a very long time, and that three times previously had the report come up for acceptance, only to be returned for alterations. In its present form, however, such alterations as had been suggested and which in the opinion of those whose work it had been to draw up the report had been made, and after an exceptionally brief discussion in which Souther championed the acceptance of the report as submitted and gave it his earnest support, it was unanimously voted accepted.

One other report which was accepted, or rather virtually accepted inasmuch as it was voted that the Standards Committee be empowered to act upon it for the society, was the report of the division which had under advisement the standardization of magneto mountings and dimensions. For a long term of years it has been the universal practice among magneto manufacturers to provide instruments for four and six-cylinder engines in which the taper on the armature shaft was different. The principal point which was settled in the report concerned this taper, which was recommended to be made the same for both four and six-cylinder instruments. The taper adopted, however, now is standard for four-cylinder instruments; hence there will be but little change necessary. Several other matters of a minor nature also were covered in the report, which, as has been said, was turned over to the Standards Committee as a whole for action. Inasmuch as Chairman Souther has come out strongly in favor of the acceptance of the report and

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his views were in accordance with those of a number of other members present, it is altogether likely that the report will become in actuality recommended practice.

The third report which was accepted as recommended practice was that of the division which had undertaken the standardization of electric lighting systems. Recommended practice in this case, as accepted, consists in using the Eddi-Swan base sockets in place of any other base sockets for lights, which, in the case of head lamps, are not to exceed 20 candlepower, and in the case of side and tail lights, not to exceed four candlepower. Some little discussion was engendered by the recommendation for Eddi-Swan base sockets, on the ground that they are useful for only two-wire systems, whereas the tendency toward single wire systems already has manifested itself and may in time become general. It was patiently explained to the member who made the objection, however, that inasmuch as the filament of every lamp must needs have two terminals, it made no difference what style socket was used, or whether the system was single or double wire. The preference for the Eddi-Swan base socket was due to its almost universal adoption by railway Pullman car manufacturers, whose products are subjected to much hard usage, it was explained, and for no other reason.

The report of the Data Sheet Division, Cecil P. Poole, chairman, also called forth slight discussion and several suggestions of a very valuable character. The work of the committeemen was commended and their activities in getting the sheets into their present form was praised. In view of the fact that no small number of manufacturers have within the past few months sent out much valuable material in the form of sheets suitable for inclusion in the S. A. E. binder, it was suggested that the manufacturers submit the "copy" for such sheets to the Data Sheet Division first, for revision and editing and classification, so that they might be included in the index and thereby be made of immensely more value. It also was suggested that manufacturers date their sheets as issued, in order that superseded sheets easily might be located and removed. Another suggestion which was made was that whenever data collated from technical papers and magazines was incorporated in the sheets, the name of the publication, the date, and, in fact, complete information be given, in order to facilitate the location of the authority for the data. All of these suggestions the committee has under advisement, and will act upon insofar as they see fit.

The report of the Truck Standards Division, of which William P. Kennedy is chairman, was another that called forth discussion. David Ferguson, of the Pierce-Arrow Motor Car Co., criticized very severely the schedule of truck speeds, which has been adopted by the N. A. A. M. and (so he thought) the S. A. E., his contention being that to operate a 5-ton truck at 8½ miles an hour, which is the speed recommended by the N. A. A. M., is nothing short of foolish, and in his opinion can not profitably be done. He said that his company was operating 5-ton trucks, and had been doing so for 18 months, at 13 miles an hour, with markedly excellent results, and that he saw no reason for recommending lower speeds. Afterward it was explained to him that the S. A. E. has recommended or adopted no specific speeds, though speeds even lower than those recommended by the N. A. A. M. have been tentatively suggested. As regards the standardization of wheel sizes, Ferguson further remarked that because it was impossible to apply the particular make of tire which his company uses to the S. A. E. standard wheel, his truck wheels were not built according to S. A. E. standards. This also was explained by Kennedy, the chairman of the committee, who stated that



HOW SOME MEMBERS AMUSED THEMSELVES—THE KITE THAT WOULD NOT FLY

it was not the purpose of the committee to standardize either the felly band, to which the tires are attached, nor the method of attaching the tires. The purpose was merely to standardize the external diameter of the felly band, in order that tire manufacturers could stock tires which are of standard size and therefore may be applied in the shortest possible space of time. Already, Kennedy added, wheel makers have commended the action of the S. A. E. in standardizing wheel sizes, which, he said, had in one instance permitted one wheel manufacturer to stock wheels in advance and thereby release a matter of $10,000 for other purposes.

Very little discussion was brought out by any of the other reports rendered, the exception being the report of the Miscellaneous Division, which, among other things, has recommended certain sizes of rod ends and yokes for preferred practice. Though some slight objection was raised to the standards which have been adopted on the ground that insufficient bearing surface was provided, the concensus of opinion appeared to be that the bearing surface was adequate for all present purposes.

Of course the topic of standardization, brought up by Henry Souther's paper, entitled, "The Standardization Work of the Society of Automobile Engineers," was the one which caused the greatest amount of discussion. The paper, however, was largely a reply to those who have been insistent in their demand for an authoritative statement as to exactly what the society is doing and intends to do in the nature of standardization, and was a masterly portrayal of the situation in its every phase. Subsequent to the reading of the paper, which required upward of an hour, the opinion was general that the paper was timely, inasmuch as there always has been more or less trouble and dissatisfaction over the efforts of the Standards Committee. So completely did Souther cover his subject, however, that there really was very little left unsaid, and consequently there could be little discussion that was of an illuminating characted. There was no lack of speakers to add thoughts to those expressed by Souther, though they were largely in the nature of commendations for the completeness of the paper and the exhaustive manner in which the subject had been treated.

The papers that caused by far the greatest amount of discussion and which were productive of real results, were those by Herbert Chase (A Comprehensive Motor Test) and Herbert L. Connell (Standardization and Co-operation in Motor Testing). As Chase's paper was inordinately long and full of charts, and as it already had been published in the May issue of the S. A. E. Bulletin, it was not read at length, the author being content to read extracts from it and to call attention to certain other portions which he deemed of prime importance. Connell's paper was read in its entirety and proved to be upon a subject which for a considerable time has been uppermost in the minds of not a few of those present. Because the time was getting short and because of the character of the two papers, which were upon closely related subjects, it was directed that discussion include them both insofar as was possible.

The principal point that was raised in Chase's paper concerned the carburetter. David Ferguson pointed out that in the results of the tests, a slightly greater maximum horsepower had been obtained though the thermal efficiency of the motor and the fuel economy was comparatively low. This, he suggested, probably was due to the fact that the motor was tested with a carburetter other than that which had been developed for and on the engine. He suggested that very probably better all around results and greater efficiency might have been shown provided the carburetter developed for the engine had been used in the tests. Very much the same view was held by Robert W. A. Brewer, a visiting member

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from England, who called attention to the fact that the percentage of air in the mixture was lower than usually is the case, and suggested that whereas only some 14 per cent. of air was used, the better proportion to use in order that the percentage of free oxygen as revealed by analyses of the exhoust gases, might be decreased in the burned products, would have been approximately 18 per cent.

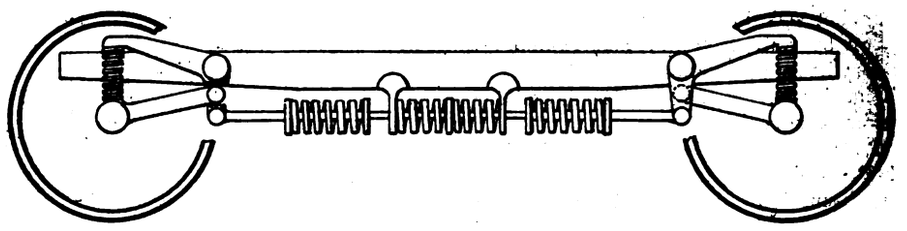
In the discussion which followed the reading of Connell's paper was revealed the state of chaos which obtains as regards methods of making engine tests. It was the concensus of opinion that the standardization of some form of motor testing would materially benefit the industry in general, inasmuch as no two manufacturers at present work along the same lines, and the results are far from being comparative. The horsepower rating, as obtained by the old A. L. A. M. formulæ or the revised S. A. E. formulæ was known to be inaccurate and misleading, though up to the present time no more suitable formula had been developed; nor was it likely that a more suitable formula ever would be developed. There was no general understanding of exactly what a comprehensive motor test should embrace. Even the schools and technical universities often were at a loss to lay down lines along which to work. If the S. A. E. could standardize a form of motor testing, it was pointed out, it would not only form the basis of proper tests, but the results then would be comparative. Similarly the work would be of immense value to the individual manufacturer whose plant was not equipped for making motor tests, for the reason that he then could have such tests as he desired undertaken at the well-equipped laboratories which are available at the various colleges. That there is need for standardization of such tests there was little reason to doubt, and that there was a similar need for a basis upon which colleges and technical schools could work in making proper tests—tests that would be of value for comparative purposes—was practically certain.

It also was brought out in the discussion that there is a crying need for a properly equipped testing laboratory in the vicinity of Detroit—a laboratory that shall be equipped not only for making motor tests, but for testing the strength of materials and for fractional distillation of fuel, and the testing of lubricants, and every other matter which at present is undertaken only by the government or by technical institutions. Already one manufacturer had laid plans for such a laboratory for his own private uses and had made an outlay of some $10,000 for a site and equipment.

As a result of the discussion it was suggested that the S. A. E. look into the matter with a view to ascertaining the views of manufacturers as to the practicability of establishing such a laboratory from a fund to be contributed by them, the whole venture to be under the direct supervision of the S. A. E., and the laboratory to be in charge of a competent man. tI was regularly moved and seconded, and unanimously voted, that a committee be appointed to ascertain the views of Detroit and other manufacturers with regard to the proposed plan, which, it is hoped, will be so laid as to encourage the manufacturer who already has made arrangements for the establishment of a laboratory, to turn it over to the S. A. E. as a nucleus for the proposed S. A. E. laboratory.

Novel Australian Spring Suspension.

Australia has not been very conspicuous heretofore, so far as the rest of the world is aware, in the evolution of improvements in motor cars, possibly because the strenuous occupations of sheep raising and kangaroo chasing leave the inhabitants little time to devote to mechanical pursuits. Recently, however, there has come from the big island in the south news of an automobile spring suspension system that is sufficiently radical to make up for a great deal of the inventive backwardness of the past. Not only is the arrangement of springs and levers somewhat startling, but the results of the tests made have been such as to call forth favorable comment from men whose opinions are worth while.



CHARLEY SPRING SUSPENSION SYSTEM IN DETAIL

As the accompanying illustration shows, there is an entire absence of leaf springs in the system, all the springs being of the helical type and all working under compression. By virtue of the lever action, which for all its simple appearance is decidedly complex when it is analyzed, the weight of the car is divided among the various springs. Not only is the downward tendency of the body, as when the car wheels drop into a hole, checked by the spring arrangement, but the rebound is caught, cushioned and killed.

The device is being exploited by the Charley Taxi and Car Co., of West Melbourne, Australia; the company has constructed a car embodying the novel cushioning device and has made demonstrations that were of extraordinary severity. The machine is equipped with solid rubber tires, so that all the credit for the meritorious work done could be given to the suspension.

Los Angeles Christens the Perfex Car.

For some reason automobile manufacture has not flourished on the Pacific Coast, several factories with ambitious plans having ceased to exist in Los Angeles after more or less troubled and unprofitable existence. Despite the fact, James Fouch is the moving spirit in a newborn enterprise of the sort which is conducting operations at 126 East Jefferson street, Los Angeles, where his first car, styled the Perfex, was turned out last week and christened with considerable ceremony with a bottle of Owens River water by an official of the Los Angeles Chamber of Commerce. The car is the first of a run of one dozen which now is in process of manufacture. Fouch, who apparently is trading as the Perfex Co., states that several wealthy Easterners, among them Paul Brown, a New York stock broker, are interested in his new venture.

Nine Arrests Follow Factory Thefts.

When John O'Connell, a former employe of the White Co., of Cleveland, O., was arrested charged with the theft of goods, principally tires, from the factory, the company little expected the case would lead so far as to involve other employes and numerous garage men about the city; but when O'Connell undertook to testify before the grand jury the loophole in the stock was discovered and the method of disposing of the stolen goods was revealed. As a result, the grand jury indicted eight men for receiving stolen property, as follows: L. Herman, manager of the City Auto Livery Co., two tires, valued at $50; L. J. Converse, 228 Rozelle avenue, East Cleveland, proprietor of a garage at 1719 Euclid avenue, four tires, valued at $100; Mark Russell, cashier of the White Co., two tires; Henry Ryer, 863 East 79th street, night watchman at the White Co., two tires; John Hantack, Auto Livery and Garage, 3211 Prospect avenue S. E., two tires; Herman Holl, grocer, 6811 Clark avenue S. W., two tires; Herman Kruger, 4075 East 78th street, four tires and four casings, and Harry Osgood, chauffeur, City Auto Livery, two tires.

Exploding Air Tank Wrecks Building.

Exploding under the high pressure maintained, a compressed air tank, used in filling automobile tires, blew up Friday, June 28, in the second story of the Eureka Garage, St. Nicholas avenue and West 122d street, New York City, and tore a hole in the roof, breaking windows and causing other damage. The tank was thrown fifty feet across the room by the force of the explosion, struck an elevator shaft and rebounded, wrecking an automobile. The fire department was called out, but was not needed. Four men who were at work in the room escaped injury.

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HUDSON "37" SUCCESSOR OF "33"

Long Stroke Motor and Electric Lighting System Features of New Model—Clean Design Remains a Characteristic.

Retaining the general characteristics of the 33 horsepower model, which it replaces, but at the same time embodying several improvements in matters of detail, a new Hudson, designated model 37, has taken its position as the central figure of the Hudson Motor Co., of Detroit, though its standing doubtless will be disputed by the six-cylinder model, which is well in hand but which has not yet made its formal bow to the public, so to speak.

Like its predecessor, the "37" derives its designation from the horsepower rating of the motor, and like the "33" it retains the clean design and simplicity which are Hudson characteristics. In order to increase the horsepower from 33 to 37, the bore and stroke have been raised from 4 x 4½ to 4⅛ x 5¼, thereby bringing the motor into the true long-stroke class. The additional power and the slight increase of size that goes with it are accompanied by slight constructional differences throughout the chassis, notably in the wheels, which have been increased in diameter from 34 to 36 inches, and in the brakes, which, formerly 12 inches in diameter, now are 14 inches.

Perhaps the most conspicuous new thing is the built-in Delco electrical system for ignition, lighting and motor starting, the motor-dynamo which forms the chief part of this apparatus being bolted to the right-hand side of the engine, as shown in the accompanying illustration of the power plant. The dynamo is driven from the flywheel, on the rim of which gear teeth are cut, meshing with the shaft pinion of the dynamo; the machine, used as a motor for starting, of course drives the engine through the medium of the same agency. The Delco system takes care of the ignition, which is of the dual type, the illumination and the motor starting, with the addition of a dry battery for emergency ignition use.

Silent running always has been a feature of Hudson cars, and though it would seem as if there was not a great deal of room for improvement in this direction, the trend of the trade has been followed in further eliminating noise. Many factors contribute to the much-desired quality of quietness. The valves are operated by push-rods that have large bearing surfaces, ensuring a close fit and lack of the lost motion that means noise; the covering plates over the valve stems shut in the slight clicking of the tappets on the stem ends, as well as protecting the working parts from dust. The timing gearing, which in many motors is a prolific source of racket, in the Hudson motor is of the worm type, running in oil, and there is an entire absence of sound from this part of the mechanism. With springs that do not squeak or rattle, accurately cut gears in the gearbox and the rear axle, close fitting of parts throughout the car and an efficient muffler, there is very little chance for undue noise.

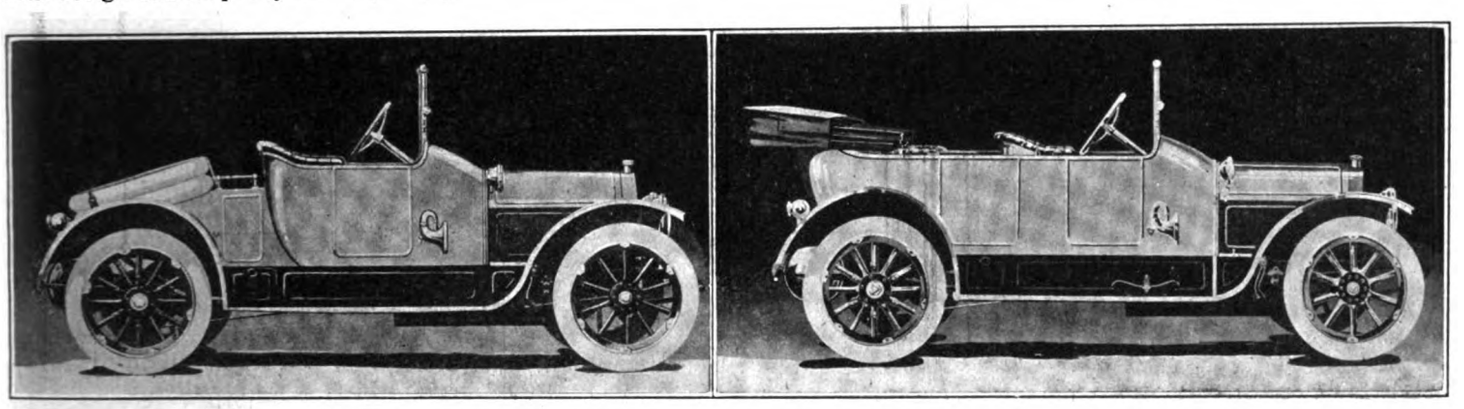
While the Hudson "33" is a comfortable and easy riding car, largely because of the long, flexible springs and the correct hanging of the body on them, the new car has gone a step further in this matter also, and by the two-inch increase in wheel diameter, bringing the wheels up to 36 inches, and the fitting of 4 inch tires in place of the 3½ inch pneumatics formerly used, to say nothing of the effect of upholstering that is no less than 12 inches deep, the Model 37 has been made even more comfortable.

The controlling system, which has been changed in details only, is composed of the usual two side levers, on the right hand side, for the change gears and the emergency brake, a pedal for the clutch, another for the service brake, and the throttle and spark levers on top of the steering wheel, remaining stationary when the wheel is turned. The steering wheel is no less than 18 inches in diameter, and operates through the medium of a worm-and-sector mechanism which is noiseless and, of course, irreversible. The side levers are carried inside, thus maintaining the smooth, clean outward appearance of the flush-sided bodies.

The principle of the unit power plant system that was employed in the 33 horsepower car, with the motor carried directly on the main frame by a four-point suspension, is retained, with the block-cast cylinders, centrifugal water pump, three-speed selective gearset and disk clutch with cork inserts in the flywheel. The use of the new starting system, however, has necessitated some motor changes, such as the placing of the intake manifold on the left side with the exhaust manifold, and the removal of the pump from the front to the right side of the motor. The lubrication system is of the constant level splash variety, the oil level being maintained by a force-feed pump driven from the camshaft. Though both intake and exhaust manifolds are on the same side, they can be removed without either interfering with the other. Valve stems are enclosed, as heretofore, and the motor—and, for that matter, the whole car—is notable for its extremely quiet running, as is the older and less powerful car.

To the rear of the power plant changes have been made also. In place of the steel tube enclosing the propeller shaft, there is a torque arm, of pressed steel, to the right of the shaft, the shaft itself being bare. The torque arm has the usual double spring buffet mounting at the forward end. Drive is directly through the three-quarter elliptic rear springs, which are 50 inches long and 2 inches wide, with a large number of thin leaves—an arrangement that is more conducive to easy riding than a smaller number of thick leaves. All the leaves are of the tongue-and-groove type, to prevent lateral misplacement, and are assembled with graphite between them to avoid squeaking and to give the readiest possible action; the eyes are bushed with bronze. From the more usual place under the front seat the gasolene tank has been moved down to the rear of the frame, where it is supported by heavy brackets and leather lined steel straps. An air pump driven by the camshaft provides the pressure for feeding the gasolene to the carburetter. The tank, which is of pressed steel, is tested under pressure to guard against leakage; it is provided with a gasolene guage, mounted on the top, and with a drain plug at the bottom.

The new Hudson chassis carries roadster and touring bodies worked out in straight



NEW HUDSON MODEL 37 WITH ROADSTER AND FIVE-PASSENGER TOURING BODIES

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lines and short curves in a manner that is decidedly pleasing to the eye. The flush sides, clean running-boards and skuttle dashes all contribute to the simple, unencumbered appearance of the cars. The equipment supplied, apart from those items, such as starting device, gasolene gauge, etc., that are built in and therefore practically integral parts of the car, consists of electric head, side and tail lamps, interior dash lamp, an extension lamp that can be plugged in at several places, avoiding the inconvenience of an extremely long cable, magnetic speedometer with keyless clock, an extra demountable rim, tire holder, windshield, mohair top with curtains and dust cover, tools, tool box and license holder. The tool set really is a tool set, as it includes files, pliers, extra wrenches, hammer, punches and everything that is likely to be needed in the course of ordinary service.

The finishes are regularly in Richelieu blue, with chassis, hood, fenders and wheels blue-black. Pearl gray body finish is given as an option.

Gasolene Loop that Prevents Trouble.

When a gasolene feed pipe is looped or otherwise bent in order to avoid the rigidity and liability to breakage of a straight pipe, air locks and consequent interruptions of the flow of fuel are likely to occur after filling the tank unless sufficient gasolene is poured in to produce the pressure required to drive out the air that will be trapped if the loop or bend is made in a vertical plane. If the loop is turned so as to lie horizontal, however, there will be no such trouble. Incidentally, a complete loop is the best safeguard against crystallization and consequent breakage of the pipe.

Beeswax to Prevent Rusting of Rims.

The rims of automobile wheels will, even though they have been well painted, rust in time, and the rust will cause excessive tire wear. If the rims are heated by means of a blow torch and a coating of beeswax applied, the further formation of rust will be prevented, for the wax and rust will form a hard compound impervious to water.

INCREASE POWER BY FUEL PUMP

Old Device to Gain Maximum Motor Efficiency Resurrected Abroad—Complication That Offsets Advantages.

In the desperate struggle in which some of the foreign motor manufacturers are engaged in the effort to obtain the greatest possible power from a motor of a given size and weight, all sorts of ingenious expedients are resorted to—and usually abandoned after a few trials. One of the latest, which, however, is old in principle, is of European design and involves the use of two pumping cylinders, one for each two of the four cylinders of the motor. The two extra cylinders are placed at the front of the motor and are driven from the crankshaft; connection is established with the working cylinders through suitable ducts and valves, the valves being in the intake valve chambers just above the service valves. The system also involves a rotary distributer.

The working cylinders draw their charges from the carburetter in the usual way; at the same time, the auxiliary cylinders draw combustible gas from the same source. When a working piston has reached the end of its intake stroke, and the cylinder is full of gas, the auxiliary valve opens and one of the pumping cylinders forces in an extra charge of mixture under pressure, so that the material available for explosive purposes is considerably in excess of the normal. Quite naturally, the force of the expanding charge when ignited is tremendous. But the pumping cylinders have a further duty. At the end of the exhaust stroke the auxiliary valve opens again, and the cylinders are scavenged with mixture from the carburetter, so that not only do the working cylinders receive more gas than they are entitled to, so to speak, but there is no dilution of the mixture with burned gas left over from the previous explosion.

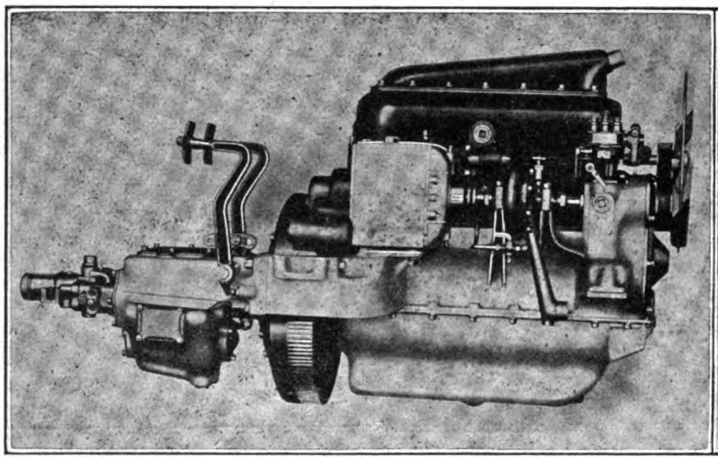
It goes without saying that the fuel consumption of this motor is very high; but as the idea was to obtain power, the question of fuel economy was relegated to the background. It is said that the noise of the exhaust of this engine is something terrific—which, of course, is what might be expected—and that the power obtained is considerably in excess of what had been developed by other motors of similar cylinder capacity. There are, however, very decided limits to the results obtainable from an expedient of this sort—for instance, the limit of compression without pre-ignition has to be considered. While the experiment is interesting, it hardly is to be expected that its results will be of much practical value because of the extra complication.

Fixes Rate of Hire for Cars per Hour.

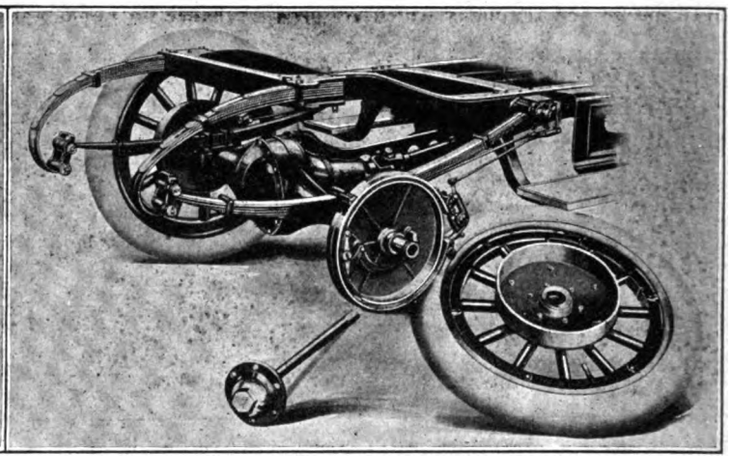
While the use of an automobile for political purposes often has been regarded as financially profitable to a high degree, the motor car liverymen of Indianapolis have been given a jolt by a judicial decision adverse to Frank P. Cox, who had billed his car's services at $4 an hour for carrying Democratic voters to the polls at the recent primaries. Fox sued Thomas S. Meeker, who had contracted for the cars, and the defense was that $4 an hour was excessive. Judge Clarence E. Weir of Superior Court readjusted the bill, allowing $3 an hour, which he declared was quite sufficient, and allowed Fox a total of $149.50 for toting the balloters.

Kankakee Limits Taxicab Charges.

While New York and some other of the larger cities of the country are wrestling with the taxicab fare probem certain smaller towns are going ahead and fixing rates for the motor cabs, and the rates, once fixed, are enforced. Kankakee, Ill., is the latest to add itself to this list, and has made rates as follows: From depot to depot, one person, not to exceed one mile, 25 cents; exceeding one mile, 50 cents; for each additional member of the party, 25 cents; no charge for children of party under five years of age.



DYNAMO SIDE OF HUDSON MOTOR



REAR CONSTRUCTION SHOWING NEW TORQUE ARM

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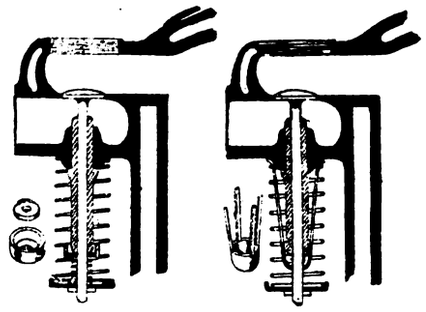
WORN VALVE STEMS ROOT OF EVIL

Obscure Source of Trouble Often Reflects on Innocent Carburetter—Remedies Other Than Replacement.

All carburetters are more or less good and, similarly, all carburetters are more or less bad; there is not one that has no good qualities, but it remains for future generations to evolve carburetters innocent of all evil. No matter what view of the matter may be taken, however, there is no doubt whatever that a great many carburetters are given credit—or discredit—for failing to perform their mission, when the aspersions should be cast upon some other vital part of the power plant, which, nevertheless, escapes notice for reasons that vary with the character of the parts concerned. Troubles resulting from faulty ignition are not infrequently visited upon the unoffending gas-maker; leaks in the intake connections often give distressingly correct imitations of carburation evils; and last, but not least, though usually most unsuspected, worn valve stems cause the motor to misbehave very much as though the carburetter was doing those things that it ought not to do, or failing to do those things that it obviously ought to do.

The logic is simple enough. When a valve stem or its guide is worn—and it is the stem—nine times out of ten, rather than the guide—there is an opening made through which unwelcome air can find ingress, under the urgent suction of the piston; the mixture that goes to the cylinder is diluted more than it really ought to be, and more or less abnormal action takes place, according to the extent of the dilution. If the proportion of air admitted in this underhand way was uniformly in proportion to the volume of the mixture, and was the same for all cylinders, matters would not be quite so bad; but naturally the greater the suction the larger the quantity of superfluous air admitted per charge of mixture and, as the partial vacuum is greatest when the throttle is partly closed, it follows logically that there will be more trouble due to diluted mixture at low and medium than at high speeds. The lower the speed the greater the quantity of gasolene must be mixed with the air in order to adequately enrich the air; if, therefore, the carburetter is so set that the engine runs as well as it can be made to run at the lower rates, it will run badly at higher speeds, consuming an excessive quantity of fuel per mile and tending to produce carbon deposits and heat up the engine.

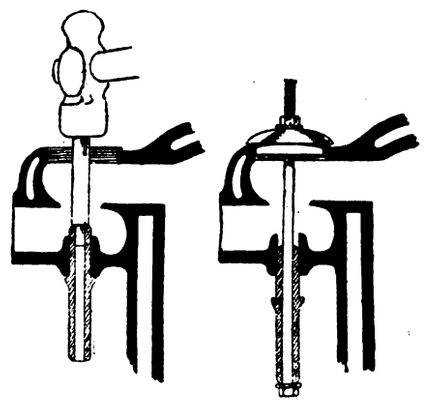
Of course, the extent of the trouble will vary with the amount of wear of the valve stems, and may amount to anything from an occasionally mysterious miss to a thoroughly unruly functioning of the motor. Not only is there lack of uniformity of the super-auxiliary air supply at different speeds, but as the different stems are likely to wear at different rates there is a probability that the unostentatious but very industrious extra air inlets will so vary in their evil capacities that no two will admit just the same volume of air, so that a carburetter correction that would help things, so far as one cylinder was concerned, might have just the opposite effect on other cylinders. In many instances the effects of leaky valve stem guides are sufficiently like carburation troubles—so much so that



FIGS. 1 AND 2

even those who might be expected to know better often are deceived, and it is not at all uncommon for a carburetter expert to fail to make a correct diagnosis.

Worn stems are not by any means peculiar to inlet valves; exhaust valves are in the same class, in this respect. The effects are different, however, for instead of atmospheric pressure from without, as in the case of the inlets, there is pressure from within—that of the exhaust, hot from the cylinders and seeking exit. If there is a



FIGS. 3 AND 4

narrow passage along an exhaust valve stem, the eager gas does not neglect the opportunity, and a sizzling hot little streak will follow along the channel, heating up the stem, burning away and carbonizing the lubricating oil, if there happens to be any present, and, finally, blowng out upon the valve spring which, in case of a bad leak, might be softened and its usefulness destroyed in a way that would appear nothing short of mysterious.

The evil having been hunted down, it remains to provide a remedy. Heat, particles of carbon and the difficulty of adequate lubrication make it extremely hard to do very much to mitigate the conditions under which the exhaust valve stems work; but there seems no really good reason why the intake valve stems should not be protected. The accompanying illustrations, from the "Auto-Motor Journal," indicate how such protection may be added to valve mechanism of the ordinary type. In Fig. 1 is shown the simplest method, which consists of placing over the lower end of the valve guide a brass cap containing a felt washer, both cap and washer having holes through which the valve stem passes, as snug a fit as possible without binding. A helical spring, small enough to go inside the valve spring without touching it, rests against the spring washer on the valve stem and holds the brass cup and its washer against the end of the guide. Before being put in place the washer is soaked in oil and dipped in flake graphite. A few drops of oil a couple of times a week will keep the valve stems thoroughly lubricated; and while the primary purpose of the arrangement is to provide lubrication, it also acts as an efficient excluder of dust, much to the benefit of the valve stem. In the case of valve springs that are too small in diameter to permit the use of the arrangement shown in Fig. 1, a cap can be made like that shown in Fig. 2, which works on the same principle but is of smaller diameter and a little deeper. It is held in place by three or four brass fingers extending upward and pinched between the top of the spring and its seat on the cylinder casting. Both these devices are easily made and even more easily applied, and are extremely beneficial in their effects. They are of no use, however, if a valve stem already has been badly worn, for while further wear might be checked somewhat and leakage decreased, the only real remedy is a new valve or a new guide—or both, according to the conditions.

In removing a valve stem guide difficulty occasionally is experienced because the guides, which commonly are pressed into the cylinder castings, sometimes fit so tightly as to refuse to move without the application of considerable force. The proper way to remove a guide is to drive it with a hammer and a piece of brass or copper, as shown in Fig. 3. The soft metal is useful because it prevents the burring of the end of the guide, which might prevent its pasasge through the opening If the guide is to be used again there will be a double reason for using the soft driver. If the guide is so tightly fitted as to resist a few fairly sharp blows of the hammer, it can be persuaded by heating the cylinder by circulating hot water through the jackets until the iron surrounding the guide is so hot that the hand cannot be held on it, pouring cold water through the hole in the guide for about fifteen seconds and then quickly using the hammer and soft driver. The combined expansion of the casting and shrinkage of the guide will make the task an easy one. Once in a long while a motor is found in which the guides are screwed in.

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In such a case it is obvious that no amount of hammering or of alternating heating and cooling would do any good—except that the latter process might be useful in case the threads had been screwed up very hard.

In putting in new valve stem guides care should be exercised not to burr or deface the metal; and though, of course, the hammer and soft driver—or, better yet, a block of hard wood—can be used, a better way is to make an appliance such as is shown in Fig. 4. This is simply a long bolt fitting snugly in the valve stem guide, with a head to keep it from pulling through. The opposite end is threaded and is passed through a yoke or cap on the top of the valve chamber. By screwing down the nut the guide is pulled steadily and truly into place without danger of breaking or burring.

The application of lubricating caps to valve stems already much worn is merely an excellent illustration of the old saying anent the securing of the stable door subsequent to the departure of the equine occupant; but applied to valve stems in good condition, these little lubricators will keep the stems in good condition for a surprising length of time.

Tiny Hammer of Enormous Power.

The sclerescope, an instrument which tests the hardness of metals by means of a little "tup" or hammer which is allowed to fall on the surface to be tested, is a rather remarkable example of the application of a simple principle. In testing metal by indenting the surface, which is one of the methods employed, it is necessary to apply the equivalent of enormous pressure. To indent hardened steel, for instance, requires a pressure of something like 500,000 pounds per square inch; yet it is done, in the case of the scleroscope, with the little tup hammer, the weight of which is only 40 grains. The secret of this seemingly impossible feat is that the area placed under pressure by the hammer is exceedingly minute, being 1-5,000th part of a square inch, and this is so small in comparison to the weight of the hammer that the pressure on it, slight as it is, is sufficient to make a microscopic pit. Of course, as the area is 5,000 times less than a square inch, the pressure required is 5,000 times less than that required to indent a square inch, or 100 pounds, which is the striking force of the little hammer.

When Battery Jars Begin to Bulge.

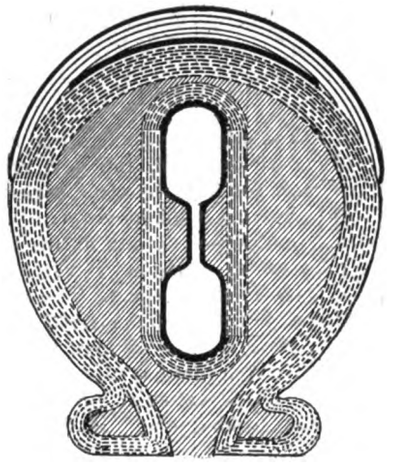
If through excessively rapid charging or discharging a battery becomes so heated that the rubber jars begin to bulge, they should be supported at the sides, if possible, until they have had time to cool and harden again. Usually it is very difficult to do this, but if it can be managed much trouble may be saved. Owing to the mass of solid metal and the volume of liquid heated up to a high temperature, the cooling process takes considerable time, and if the jars are badly softened there is much danger of their destruction.

"PNEUMATIC" TIRE MINUS AIR

Brooklyn Inventor Makes Startling Use of Vacuum Principle—Air Pumped Out of Instead of Into Tire.

Since pneumatic tires first were fitted to wheels, and their superiority in point of resilience over solid rubber tires demonstrated, many, many attempts to so improve the air tire or to supplant it with a tire equally as resilient, yet free from the possibility of rupture which renders the tire useless for the time at least, have been suggested, tried, advertised, sold, and discarded as incomparable with the air filled tire in easy riding qualities.

The trouble with all of the substitutes, according to the views of Willard J. Woodcock, of 102 Gates avenue, Brooklyn, N. Y., who just has perfected and placed on the market a tire which is radical from the letter "r," is that the elimination of the air limits the elasticity of the tire to a point within the elastic limit of the substance of which the tire is constructed, so that a tire which depends for its easy riding qualities on the compressibility or extensibility of solids never can compete with the pneumatic, since air has no elastic limit.



WOODCOCK "VACUUM" TIRE

With these principles in mind, Woodcock has evolved what he terms a Single Tube, Wrapped Tread, Vacuum Tire, a cross-section of which is shown in the accompanying illustration, the innovation being that the air is pumped out from the interior by means of a suction pump instead of being compressed into it, as is the case with orthodox construction. The air chamber, or it might better be termed the vacuum chamber, for very little air remains after the pumping operations have been completed, is half an inch wide and two and seven-eighths long when no pressure is exerted on the tire other than that of the atmosphere. When the weight of the car is applied, however, the chamber tends to widen in the middle and this tendency is resisted by the pressure of the atmosphere which is exerted on the outside of the tire. Thus, according to the maker, the vacuum tire, like an ordinary pneumatic, depends for its resilience on the elasticity of the air, and yet blowouts are impossible, for the pressure is all external and the fabric is not strained. Punctures, although not impossible by any means, need not necessarily occasion delay, for sufficient rubber is embraced in the construction for the tire to be used as a cushion tire, even when entirely "inflated." The heating effects, too, are not so much in evidence, for the rarification of the air, as each shock is encountered, tends to keep the tire cool. The tires are at present made in two sizes only—34 x 4 and 35 x 5½, but the inventor hopes to be able to supply them in all stock sizes to fit Q. D. rims within the next few weeks.

Evidence Affecting Electric Starters.

Although there are those who are disposed to fight shy of electric lighting and electric motor starting systems because of their seeming complication, and because of lack of general understanding of electrical principles, firsthand evidence obtained by the Cadillac agency in New York during the past several weeks is of the sort to show that not only there is little room for scepticism but that the electric device has reached a state of reliability that is not to be denied. In order to satisfy itself, and to secure the information, the Cadillac agency addressed inquiries to some 500 users of Cadillac cars fitted with the Delco Electric system, asking, among other questions, how often it had been necessary to use the starting crank and for what reason. Of 67 who replied, and who represented a total travel of 208,489 miles, but six reported having used the crank and the necessity therefor was, in each case, of a trivial nature. In two instances, wires had become disconnected, in two others, dirt or grease had affected the connection and in the others a loose connection and a rod which required adjusting were the causes of the failure of the electric system to fail to perform its mission.

Increasing Efficiency of Aluminum Cells.

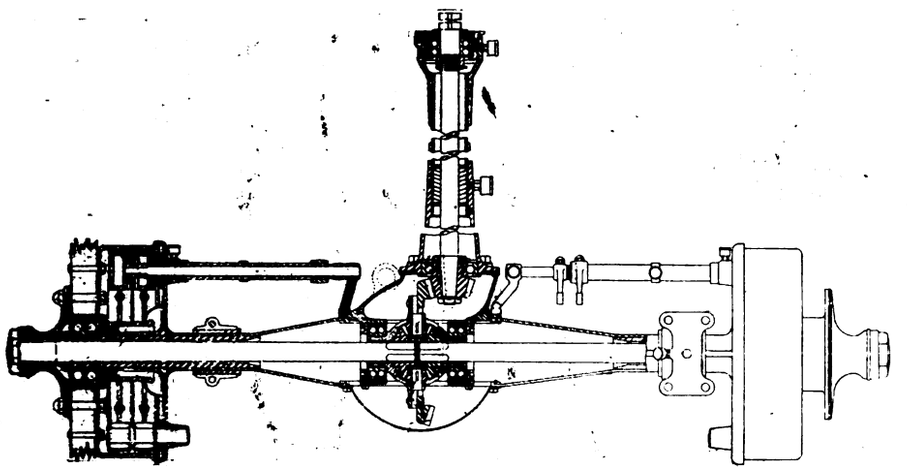
The aluminum cell, which consists of a plate of aluminum and a plate of either iron or lead immersed in an electrolyte consisting of bicarbonate of soda dissolved in water, has long been used as a rectifier for alternating currents, the chief drawback being the comparatively low efficiency—under 50 per cent.—of the apparatus when the cells are connected up in the ordinary way. The efficiency, however, can be greatly increased if the cells are connected as shown in the accompanying diagram, the connections being such that instead of totally killing one impulse and allowing the others to pass, the cells permit both impulses to pass, but "switch" them so that a continuous current is available at the D. C. terminals. The only losses are caused by the high resistance of the electrolyte, and are dispersed as heat.

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MASTERS LIVE AXLE DIFFICULTIES

Michigan Manufacturer Produces Improved Mechanical Unit—Attention Paid to Brakes Which Are Cam-operated.

The popularity of shaft and bevel gear drive, which has reduced the number of chain-driven cars to a small minority, has created great opportunities for the manufacture of live axle units by concerns which specialize in products of this class; of whom few, if any, are better known than the Weston-Mott Co., of Flint, Mich., which just has added a rear axle of that type to its line. Owing to the complexity of the rear axle unit, its many moving parts, the difficult gearing and driving problems involved and, last but not least, the fact that



CONSTRUCTION OF NEW WESTON-MOTT REAR AXLE

all the power delivered by the motor and the greater part of the weight of the car must be transmitted through the live rear axle, the production of a really good rear axle is a matter of no small engineering difficulty. How the new Weston-Mott axle meets the problems involved is made plain by the accompanying illustration; while, of course, the axle follows standard lines in its general design, it involves not a few details of special interest.

The housing, which is the foundation upon which everything else in the axle depends for stability, is of pressed steel; its manufacture is facilitated by the fact that it is made in two parts, which are welded together by the oxyacetylene process, so that the finished housing is, to all intents and purposes, a single piece. Special attention has been given to the brake question, with the result that there are two internal expanding brakes, working side by side on the same drum, and not only are they thoroughly enclosed and protected from dust, but special provision has been made for the ejection of any oil or grease that may work through along the shafts. The brake bands are each 1¾ inches wide and 15½ inches in diameter. The illustration shows quite clearly the arrangement of the brakes and their drums, the latter, of course, forming the main portions of the protective coverings and the inner ends being closed by a cap which is formed integral with the outer end of the main housing. The brakes are operated by cams which, when partly rotated on their shafts, force the bands to greater diameter and press them against the drum surfaces. The shaft of the cam nearest the wheel—that is, the outer cam—passes through the tubular shaft of the other cam. The arrangement is clearly shown.

It will be noted that there is a curved piece on the inside of the inner cap of the brake drum, quite close to the center. This forms an annular chamber into which must pass all oil that works through from the center of the axle. The shape of this chamber is such that the oil cannot escape and get on the braking surfaces unless it should overflow the annular space, and this is made impossible by the employment of an escape pipe which drains out oil as fast as it finds its way in.

The bearing at the small bevel pinion of the main drive is of the annular type, with a single row of balls, and its shaft is supported at the middle by a roller bearing. Double ball bearings are fitted at all other points. The differential gear follows standard practice in that it is of the bevel type; a removable cap at the rear side of the axle gives access to the interior.

Resistance to vertical stresses is provided by forming the pressed steel housing with a deep vertical web which runs up to the full width of the central gear housing and a little more. The spring perches, of substantial construction, are secured in place by means of cap screws with long threads running into deep lugs. All bearings that are not lubricated from the central housing are provided with special grease cups.

A magneto never should be mounted on an insulating base except when so specified by the manufacturer; otherwise the return or ground circuit will be broken.

PUTTING OLD PARTS TO HOME USE

Oregon Brings Proof That "Remains" of Disused Cars Hold Great Utility—Purposes They May Serve.

That the parts of an old car can be put to many practical uses is amply demonstrated on a country place out in the Coast mountains of Oregon. While a guest at this country place not long ago, I was struck with the peculiar shape and extremely rich appearance of a "lazy seat" that occupied one corner of the host's smoking den. When a commending remark was offered regarding it, the owner, an energetic young westerner, enthusiastically replied:

"That seat is the tonneau which was formerly a part of 'Old Betsy,' the finest and toughest touring car that ever broke a Goast Range trail. Isn't it comfy?"

I assured him that it was; for the leather, despite the hard service it had given, looked almost as good as new with its repolish. The upholstering was deep, and, taken as a whole, it was much finer and richer than the average settee.

"I couldn't buy anything like it for less than one-fifty," my host assured me. "You see, I had to drive 'Old Betsy' and never rode much in the tonneau. But I'm getting my share of the fun from it now. Follow me, and I'll show you more of her." Whereupon he led me out to his "incubator house," where some three or four machines were converting eggs into pure blood White Leghorn chicks. Though it was winter, the room was comfortably warm. Over against the wall was something that looked very much like an automobile radiator. On getting closer, I saw that it was a radiator.

"That's where the heat comes from to keep this room warm," my host explained. "I formerly had considerable trouble keeping the temperature right, particularly on cold days. Now it's easy. I simply connected the old radiator with the hot water pipes from the kitchen boiler, bent all the fins together, as you will notice, and the thing was done. All the water drawn for the kitchen must circulate through the radiator; that keeps it warm—just warm enough to make the incubators work perfectly."

Nor was this all; for down in the basement of this up-to-date country place is a four-cylinder motor. It formerly was a part of "Old Betsy." Now it is connected to a small dynamo, which, in turn, is connected to a series of four accumulators, or storage batteries. And this simple electric system supplies light for the entire place. By using the accumulators the motor needs to be operated only at odd times, thus storing electricity which can be used at any and all times. Incandescent lamps of the regular motor car type are employed, these requiring less "juice" for the maximum amount of light.

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Out in the barn I had another surprise in wait. It was a light-weight, single-horse truck. Though light, and exceedingly easy running, it would easily carry 2,000 pounds. This truck was nothing less than the chassis of "Old Betsy." Everything had been dismantled except the frame, springs, axles and wheels. The pneumatic tires had been replaced by those of solid rubber. A truck bed was placed on the frame, and shafts were attached to the steering knuckles.

"One horse can take a load in that truck at a full trot," said the owner. "It's the lightest running rig on the place, excepting the successor to 'Old Betsy,' and that runs itself. About the only thing that looks wrong about it is that big wart on the hind axle, which formerly served as the housing for the differential. But I preferred to let it remain just as it was, removing the differential gear, rather than go to the expense of having a straight axle made."

In the dining-room I was shown two more fine leather chairs, made from the individual front seat of the old car. "All I had to do was saw the old seat in two, and touch it up a little," the young rancher told me.

When I asked if this plan paid him better than that of selling the old car, or allowing it in exchange, he declared emphatically that it did.

"It puts me ahead of the game any way you want to look at it," he assured me. "I hated to sell the old car—turn her over to a stranger who wouldn't understand her whims. Something would go wrong the very first crack—something that I would know in a wink, and could fix in the dark—but would leave a stranger stranded thirty miles from home. No, sir! I just couldn't part with her. I thought as much of 'Old Bet' as I think of any horse on the ranch, and I couldn't bear to think of some softhead cussin' and kickin' her around just because he didn't have sense enough to savvy her language. They offered me $400 for her on exchange, when I bought the new car, and remarked that I was finding that much if I took it. I told them to keep the money, and wrote a check for the full price, brought the old girl back and dissected her. It isn't exactly 'Old Bet' any more, but I have the pieces to remind me of her, anyhow, and that's worth a good deal."

That was the sentimental feature of the thing—and, truly, was enough; but to fully convince me that he had "beaten the game," the young rancher wrote down the following, which shows each part as he now uses it, and how much that part is actually worth, or would cost:

"Lazy seat" for den	$150 00
Two dining-room chairs	100.00
Motor for private electric lighting system	220 00
Radiator for heating purposes	25 00
Farm truck	75 00
Total	$570 00

D. H. S.

COAL TRUCK GIANT IN ECONOMY

Replaces Five Horses and Cuts Delivery Cost Nearly in Half—Rapidity of Service a Feature.

While many coal dealers—to say nothing of those who handle other commodities—have done considerable experimenting with motor trucks with a view to finding out exactly what it costs to operate them under regular service conditions, the figures obtained rarely are available for publication, for if the machine is successful the owner usually considers that his competitors are not entitled to the free use of the fruits of his experience, and if it is a failure, the less said the better. Besides these reluctant ones, there are, of course, many whose records are of no real value because of the omission of vital features. Therefore, when data compiled in the course of a period covering three-quarters of a year is allowed to leave the sacred precincts of the bookkeeping department, it is of no little interest. Spaulding & Spaulding, of Buffalo, is a firm that has made successful use of a motor coal truck and can see no reason for keeping the figures which indicate the extent of its economy in coal transportation locked up in its books. This firm purchased a Pierce-Arrow five-ton truck, with worm drive and a power-operated screw hoisting body, and the machine was put to work in September, 1911. Since its installation the truck has handled practically 8,000 tons of coal and the cost of transportation figures out at .279 cents per ton; this includes 6 per cent. interest on the investment, insurance, wages of a driver and his helper, tires, gasolene, lubricating oil, repairs, depreciation and a fair allowance for annual overhauling. As compared with horses, the motor has done the work of two double teams and a single rig, besides reducing the cost by two-tenths of a cent per ton.

The mileage covered since September was 8,093 miles, and it is stated that the fears originally felt by the owners that the tires would prove costly have proved to be groundless; the tires were in such condition on June 1st that they were credited with having another 1,000 miles of life in them.

The most important feature of the motor delivery service, from the point of view of the man who buys the coal, has been the rapidity of delivery at all times, regardless of the weather conditions that sometimes are such as to make delivery by horses a matter of the greatest difficulty, if not almost an impossibility. It is stated that this phase of the matter has brought out no little favorable comment from customers.

An important advantage of a motor truck with a power hoist is brought out in the accompanying illustration. In many cases it is necessary, owing to the arrangement of the coal holes in the sidewalks, to place the coal truck in a position that is very inconvenient for passing vehicles, and may even cause a serious obstruction in a narrow street. Where there is a power hoist it is possible to get the coal out of the truck in the shortest possible time, and this alone often effects a saving in trouble that is not always appreciated at its real value.



PIERCE-ARROW 5-TON WORM DRIVE COAL TRUCK

Improving Spark for Motor Starters.

A condenser of proper capacity bridged across the contacts of the push button supplied on the gas type of motor starter will do much toward assisting the production of a good spark. It must be remembered that in starting, the condenser which bridges the contact breaker and absorbs the back kick is ineffective, for the simple reason that the breaker terminals are closed and the condenser short circuited. The condenser across the push button, which should be of the same capacity as the magneto condenser, will not only increase the spark by relieving the back-kick, but also by causing a quicker break. Then, too, it will eliminate much of the burning to which the platinum terminals of the button are subject and which causes all too rapid deterioration.

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INCREASED COMFORT IN AMERICANS

Changes in Equipment Rather Than in Mechanism of Famous Underslung Line —Smallest Model Unaltered.

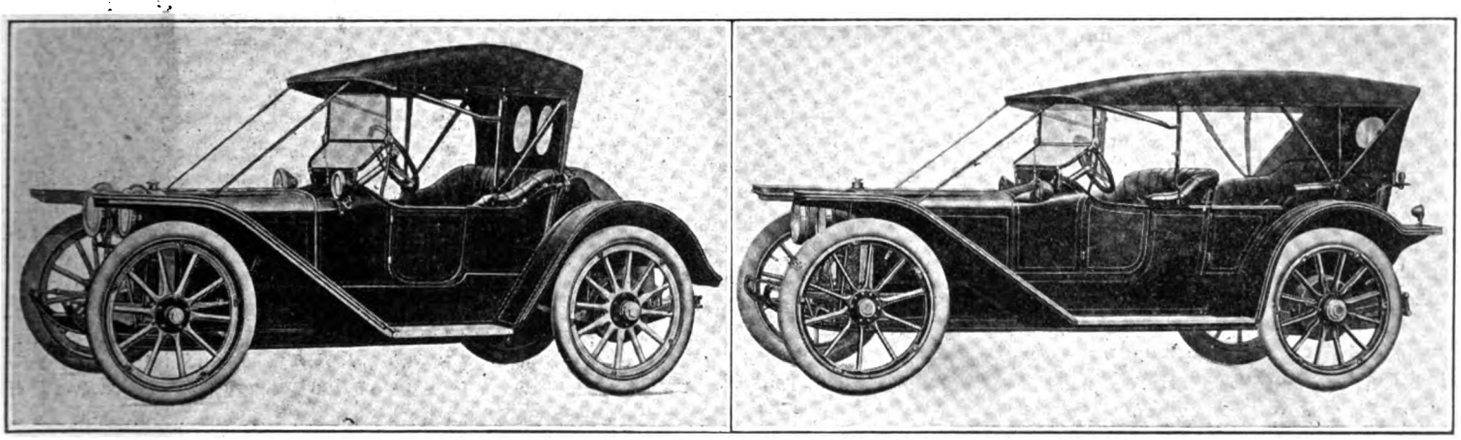
Since bringing out its first underslung motor car, some eight years ago, since which time the low, compact body and big wheels have become familiar sights on the road, the American Motors Co., of Indianapolis, Ind., manufacturers of the American underslung cars, have made many changes in details, though retaining always the cardinal feature of the machine—the underslung frame with its low center of gravity and easy riding on rough roads.

In the new models, however, which just have been announced, the changes are less important, from a mechanical point of view, than usual—in fact, the smallest car of the three which constitute the line, the American Scout, is wholly unchanged, while the largest, the American Traveler, shows alterations only in the line of equipment, and the intermediate model, the Tourist, which differs more than the others from its predecessor, shows only such changes as the adoption of the Eisemann dual ignition system and a new lubricating system in which oil is circulated by a pump in a sump in the bottom of the crankcase, and there is an oil indicator on the dashboard; this replaces the older self-contained splash system. The body has been widened two inches, giving a little additional room for the passengers; convenient pockets have been placed on the doors in the tonneau; a glove bag is located between the front seats, with an upholstered lid that does not break the continuity of the cushioning; deeper and softer cushions are used all round; the back of the front seat has a leather covering in which are large receptacles for the score of odds and ends that are convenient to have in a car. There is an extra inch of clearance between the front of the rear wheel and the running board, and the space between the running board and the frame has been enclosed in sheet metal. The front shackles of the rear springs have been enclosed in sheet metal housings as a protection against dirt. The tail light is of the electric type and is carried on the rear end of the left fender, while the opposite fender carries a license bracket.

The largest car has a motor rated at 50 horsepower, with cylinders of 5⅜ x 5½ inches bore and stroke, and a wheelbase of 140 inches and 41 inch wheels with 4½ inch tires on demountable rims. The new model is equipped with an electric starting device, which also furnishes current, when the motor is running, for the illuminating system. A Warner speedometer with clock, mohair top, side curtains, windshield, tools, etc., complete the equipment.

The Tourist has a 40 horsepower motor with cylinders of 4½ x 5 inches bore and stroke, 118 inch wheelbase, 37 inch wheels and 4 inch tires on demountable rims. There is a complete electric lighting outfit, with dynamo and storage battery, a motor starter, speedometer, top, windshield, side curtains, and so on.

The smallest car, the Scout, has a 3¼ x 5 inch motor rated at 22 horsepower, but claimed to be capable of developing 30 horsepower. The wheelbase is 105 inches and the wheels are 36 inches in diameter, with 3½ inch tires and demountable rims. In this model the side and tail lights are electric, the necessary current being supplied by a storage battery, while the headlights are acetylene. The rest of the equipment corresponds closely with that of the two larger cars.



REVISED EDITIONS OF TWO AMERICAN UNDERSLUNG MODELS—SCOUT AND TRAVELER

Wiring Lamps to Avoid Short Circuits.

When running wires for an electric lighting system, great care should be taken to see that none of the wires are so positioned that the sill of the body can squeeze them, for otherwise the constant chafing will soon cause grounds, which will be fatal to the satisfactory working of the system. The wires should be placed in the channel of the frame iron and retained by clips or brackets, which will prevent movement in so far as possible. To prevent "shorts," two wires should not be held by the same clip.

COLLEGE STUDIES TRUCK PROBLEMS

Verdict Favors Electric Trucks and Horse Is Not Entirely Discredited—Facts Gathered from All Services.

What the Massachusetts Institute of Technology is doing in the way of close and accurate investigation of the efficiency of motor trucks is realized by few, but these researches have a fundamental interest to the business man who is considering the use of motor trucks. These vehicles have sprung into existence with enormous rapidity, yet till to-day there has not been a real knowledge of whether they are truly well adapted to their work. To find this out the Institute has set itself to investigate and the close of the first year finds the work in such satisfactory condition that the costs of continuing the research have been guaranteed by various individuals and firms, among the former being Thomas A. Edison.

It is but natural that the funds for research of this kind should be furnished by business men, for aside from the direct approval or disapproval of a method or a device, there is furnished information that may serve to guide the business firm against mistake. So a year ago a fund was placed at the disposition of the Institute by the Edison Electric Illuminating Company of Boston, the only condition attaching to which was that every factor to efficiency in methods of trucking should be considered. The fund came naturally to the department of electrical engineering; Professor Harold Pender was given the direction of the investigation, and to research assistant H. F. Thomson was entrusted the details of the work.

In entering the investigation the Institute established the broadest kind of foundation, says the Boston Transcript. It took up the matter of comparative cost and efficiency of horses, gasolene motors and electric trucks; it considered light loads and heavy ones; it observed the efficiency of all kinds of teaming, from the delivery

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of parcels to heavy moving between freight terminals. It further set its students at work observing conditions that might effect teaming such as congestion in the streets, at the freight terminals, and here a great deal of new and important work has been done. It has further laid out for the future, when other funds may be available, the effects on business of the different kinds of pavement and the relations of these to the different kinds of vehicles.

The fundamental question to be discussed is as to the advantages or disadvantages of electric trucks for real commercial work. This is a field in which there is very little information as to costs, and the company, despite its own facilities for making tests, turns to the Institute, which has the plant and the working force, and whose findings shall have an authority beyond question. The whole matter has been taken up as a plain business problem, and the present question lies in the service performed in the transportation of merchandise within a thickly populated area—city and suburb—under actual conditions. It has been necessary to analyze the service, note the relationships between each element and the cost of operation, and repeat the analysis for each different kind of trucking and for the three kinds of vehicles. Thus far the Technology study has been along two lines—the determination of the demand of the different kinds of service, and, second, the study of the relative economy of the three types of wagons when used in any given service.

The method employed to get at the facts was first to secure a continuous record of the work of each kind of truck. This was done by means of recording devices. It is possible with these, knowing what the stops are, to determine the time of movement between such places, the rate of speed everywhere and the time of standing still. Each day's work is thus recorded, and the collation and comparison of many such records gives the possibility of determining efficiency. The little clocks have been placed on the wagons of a dozen firms and about seventy records are received each day. The vehicles that are thus gathering information for Technology are engaged in their regular work with their regular employes. They present selected types of city work—pick-up, furniture moving, freight handling, wholesale and retail coal delivery, parcel delivery, market delivery and the different services of an electric company and miscellaneous hauling. The vehicles vary in size from one-horse to three-horse wagons and in the motor vehicles from 700 pounds to five tons.

There are certain hitherto obscure and, indeed, unconsidered factors to cost that the work of the past year has been clearing up, the cost to teamsters of congested streets—very important in Boston—of insufficient railway platforms and the like. A truck can do in a working day only the number of miles it can go plus the time taken for loading, unloading and standing. The latter are factors not hitherto much considered. They are more important when motor trucks are in question. For example, a horse-drawn truck with a two-ton load can be counted on in city streets for a maximum of 15 miles a day, while an electric truck in the same service is good for about 35 miles. With the speeds that are practicable, three and one-half miles an hour for the horses and six and one-half for the motor, the horses will make their mileage in four hours a day, while the motors must keep moving five and one-half hours. There is little gain in a nine-hour day in reducing the standing time of the horses to less than 55 per cent. of the whole time, while the electric truck must not stand longer than 45 per cent. of the time. It is possible, therefore, to name conditions under which horse-drawn vehicles may be more economical. It is perfectly true that mechanically driven wagons have great advantages in rapidity of movement and radius of action over the horse, but it must not be forgotten that cost proportions in a business are very important. If the cost of hauling merchandise of a given class should be very small in proportion to other costs, the matter of a few cents a ton for haulage may really be secondary to such points as reliability and punctuality.

The moral of this part of the investigation is that what is eminently successful for one kind of business may not be economical for some other business. It is necessary for the merchant to put his choice of kind of vehicle on the requirements of his business. Every class of service must be considered by itself.

One matter that has been determined as fundamental, is that for parcel delivery, nine hour day, three trips, four parcels delivered per mile and one minute consumed in each delivery, three-quarters of an hour being allowed for loading and unloading and the maximum load being half a ton, the horse-drawn wagon does only two-thirds as much work a day as either the electric or the gasolene truck, at a cost per delivery of 5.9 cents (horse), 5.4 cents (electric) and 6.5 cents (gasolene), respectively. The cost per mile by horse is likewise between the other two costs. In the delivery of coal, which is moved in large lots and to a single place, with loads of five tons, the horse wagon (three horses, one resting every third day) does only about half as much work as either of the motor trucks. The cost per mile runs in the way as with the lighter delivery, viz., 55 cents, 47 cents and 58 cents, while the cost per delivery is $3.91 with horses, against $3.32 and $4.07.

But if some special service requirement is introduced, for example, a parcel delivery requiring two minutes per call instead of one, there is an increase in the standing time, a reduction of the mileage per day, while the cost of delivery is raised. The amount of this raise will be surprising to everyone, for it seems almost a negligible matter, but the fact is that with the electric vehicle the increase is 27 per cent. against 30 per cent. with the gasolene truck and 22 per cent. with the horse-drawn wagon.

Such facts as these show the importance of the investigation, for the real relations between the delivery and the other costs have not hitherto been known. Another outcome, one that is most important to the business man is the evidence of lack of uniformity in accounts. Much stress may naturally be laid on operating expenses, and yet the estimates may omit essential features. It was found, for example, in one case that the driver's wages were not included in the teaming costs; it is quite customary to make no charge for garage. Insurance and taxes are usually omitted, while depreciation, administration and interest, very essential factors, are sometimes not included.

Some of the details that have been worked out by the students of the institute for thesis work in connection with this investigation are interesting. One of the theses presented at Commencement had reference to the investigation of the traffic conditions in the Fitchburg division freight yard. It was a study to determine whether conditions are favorable. There is time consumed in entering the yard, backing, unloading or unloading and waiting. The investigation was carried on under all kinds of weather and business conditions, and pointed out as one item that the delays within the freight yard amount to only one per cent. of the whole trucking time. Such a showing is indicative of excellent administration of the yard, and it may be said that other parties, one of which was in each yard, find in general the same condition. The investigation according to the young man who read the thesis, Herbert Louis Woehling, of East Orange, N. J., shows that motor trucks are time-savers in congested places like freight yards and he suggests the ultimate supremacy of them over the horse for such work.

One of the items in this research was the time required for backing, a process very necessary in freight yard work. It was found that a one-horse wagon requires one and one-half times as long to back as the motor truck, the two-horse wagon twice as long and the four-horse hitch two and one-third times as long. In addition, the horses occupy valuable space and the motors can squirm better through a congested passage. There are students now following the wagons seeking the causes of certain delays. The work is to determine the reason, which may be, for example, waiting at a freight house for a door.

Squeaks that Arise from Speedometers.

One point which requires lubrication, but which is oftentimes neglected, is the interior of the flexible speedometer driving shaft, to which an elusive squeak often can be traced. The best lubricant for the shaft is a light grade of grease or non-fluid oil.

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WORM GEARING AS IT SHOULD BE AND AS IT IS

Terminology Criticized and Alternatives Suggested—Arguments For and Against the New Silent Driving System—Qualities That Make for Efficiency, and Details of Special Testing Appliances That Indicate the Degree of Efficiency.

Due undoubtedly to the material advances that have been made of late years in the production of mechanical parts of extreme accuracy, the worm drive has been brought to a stage of development where it is giving satisfaction in actual service not only in pleasure cars but in commercial vehicles of the heavy type, and as a consequence, interest in this silent, smooth and, under proper conditions, efficient drive is growing—not, perhaps, with the proverbial leaps and bounds, but at a healthy rate. It probably will be heightened by the paper, "Worm and Helical Gears as Applied to Rear Axles," read at the summer meeting of the Society of Automobile Engineers by Frank Burgess, the general manager of the Boston Gear Works, of Boston, Mass., in which it is stated that mileage records of from 50,000 miles to 124,000 miles have been attained with worm gear drives, and in which the author of the paper expresses his belief that in the near future a large percentage of the cars in the United States will be worm driven.

Burgess calls attention to the variety of terms applied to this drive, such as worm gear, helical gear and spiral gear, and points out the error in the use of the term "spiral," which, properly speaking, means "a line generated by progressive rotation of a point around a fixed axis with constantly increasing distance from the axis." This form is well illustrated by the hair-spring of a watch, which is a spiral and obviously differs entirely from the form of the gear in question.

"I suggest standardization of terms," says Burgess, "and that to avoid confusion any gears of the helical type transmitting motion with shaft angle at 90 degrees with a speed reduction of less than 10-1, be termed 'right angle helicals'; and with any other than 90 degree shaft angle the term 'helicals,' stating specifically the exact angle of shafts. If shafts are paralled the term 'helical spurs' should be used.

"As the term 'right angle helical' is not as convenient as the term 'worm gear', and inasmuch as for automobile work most ratios will be less than 10-1, with 90 degree shaft angle, I would suggest the term 'helical gear' as most appropriate. Otherwise it would be better to use the general term 'worm' or 'worm gear' to include all reduction ratios, even as low as 1-1. This matter should be settled promptly one way or the other."

After calling attention to the fact that worm gears, like most so-called new things, are really extremely old, the question of the relative merits and demerits of the worm gear are thus taken up:

"The principal reason for the adoption of

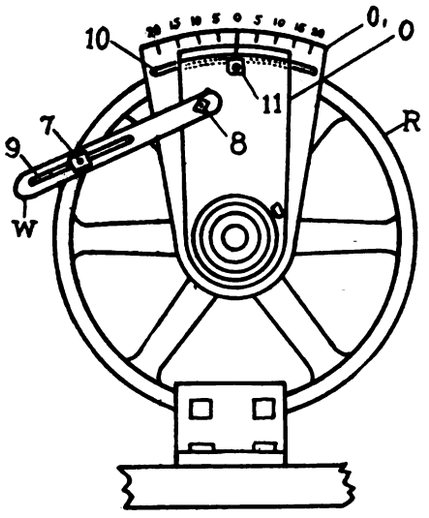


FIG. 1

the helical form of tooth appears to be its peculiar quality of silence, regardless of speed or load. With the best methods of de-

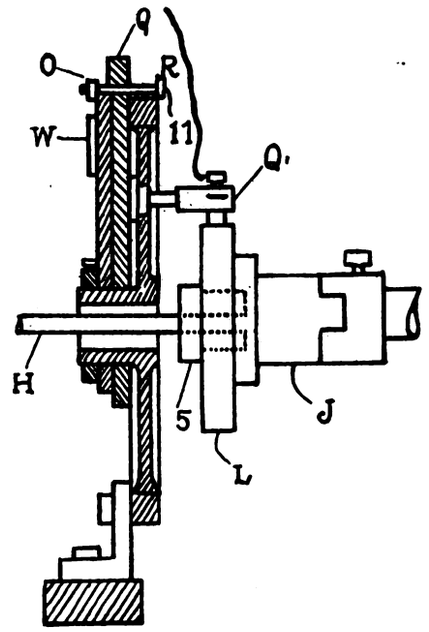


FIG. 2

sign and assembly, great durability, strength and efficiency are obtained. It is impracticable in an article of this character to cover all the details satisfactorily. However, I believe that on all styles of cars in the United States to-day the worm gear could be used successfully for rear axle purposes.

"The successful worm gear should embody the following qualifications: 1. Cheapness of construction. 2. Strength for resisting shocks. 3. Hardened and smooth surfaces for durability. 4. Material of a suitable composition to reduce friction. 5. Simplicity of construction and mounting. 6. Perfect bearing condition. 7. Noiselessness at any speed or load. 8. Reversibility. 9. Lightness in weight. 10. Efficiency in power transmission.

"Granting that there is some argument against the worm in regard to trucks as to the dead axle proposition, this could be overcome by using the worm gear on each end of the axle, the same as sprocket wheels, having a double worm gear drive in place of the cumbersome chain drive. If at first slightly more expensive than the chain and sprocket drive, less repairs will more than make up the difference. Care should be taken to have accurate and first-class bearings, both radial and end-thrust.

"Considerable discussion has arisen in regard to the relative merit of the straight and Hindley types, the latter having been first used by Hindley, of York, England. In my opinion both can be used successfully, although each has its own advantages and disadvantages. For most purposes, particularly where considerable power is to be transmitted, the Hindley has the advantage, but with ordinary machinery it is somewhat more difficult to obtain the same degree of accuracy that can be obtained in the case of the straight type.

"From tests made there is no question but that there is a larger bearing surface on the Hindley type of worm than on the straight. Therefore this type of gearing will for the same pitch present a bearing of greater durability and manifestly heat less than the straight type, particularly under heavy load.

"The straight type may have less trouble with end-thrust bearings. The worm can move in its position longitudinally with the worm axis and therefore does not require as close adjustment of the end-thrust bearings.

"With first-class bearings the Hindley type has the advantage, as a smaller and lighter gear can be used, thus reducing expense, especially if made up in large quantities.

"The worm gear should be made of a

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special mixture of hard bronze. The gear should be slightly polished after being cut to insure a perfectly smooth glazed surface to mesh with the hardened polished worm. This set of gears, properly housed, with ball bearings and the right lubricant used, will give an efficiency of at least 90 to 95 per cent.

"A simple method of testing the gears for efficiency without elaborate apparatus is to run them in their regular housing, containing a bath of oil, subjected to load to be transmitted. If they do not have a high temperature after running several hours they indicate high efficiency and suitability for the given purpose.

"That there may be a satisfactory method of knowing whether gears will be suitable before being placed in cars and tested on the road, insuring proper efficiency and absence of excessive heat finally destroying their usefulness, it is quite necessary that manufacturers of rear axle drives using this form of gearing should have a proper way of testing exactly the efficiency of the gears. It would be very expensive to replace the gears after installation. After a careful study of the best mechanical and electrical absorption and transmission dynamometers, an efficiency testing machine, similar in some respects to the apparatus used at the Massachusetts Institute of Technology by Prof. F. C. Riley, was constructed during 1911. The prony brake was adopted for an absorption dynamometer and a long shaft of a small diameter arranged to obtain the torsion of the shaft in degrees by an electrical indicator apparatus for a transmission dynamometer. This efficiency testing apparatus is shown in Figs. 1, 2, 3 and 4. On shaft H is worm 1 driving the worm wheel 2 on shaft 3, on which are prony brake wheel Y and brake-arm Z bearing on platform scales X. On each end of the shaft H are clutches I and J, in which are fitted bushings 4 and 5, in which the shaft H is sweated. Attached to clutches I and J are fiber discs K and L in which are inserted brass contact-points making electrical connection through the fiber discs to shaft H. Bearing on the peripheries of these fiber discs are spring-brushes Q and Q_1, to which are fastened insulated copper wires, in the circuit of which are located dry batteries U and the telephone receiver T. Spring-brush Q is fixed while spring-brush Q_1 is attached to sector O_1 concentric with the shaft H movable on lug of fixed iron wheel. Sector O is graduated each side of zero to 20 degrees in ½ degrees. Sector O_1 is fastened to fixed wheel R by link W and bolts 7 and 8 and is adjustable a small amount by slot 9 through which bolt 7 is clamped to wheel R. This sector O has a zero marked at the top, which moves over the graduated sector O_1, thus enabling a fine adjustment of the zero point so that the spring-brushes Q and Q_1 may be brought to coincide at the same angle. Sector O_1 is clamped to fixed wheel R by a bolt 11 through slot 10, which enables readings from zero to sector O to be determined. As the load is applied to the brake, the shaft of fiber disk L begins to lag behind the fiber disk K and the amount in degrees which this shaft lags is recorded by sectors O and O_1. The horsepower transmitted can be determined per degree

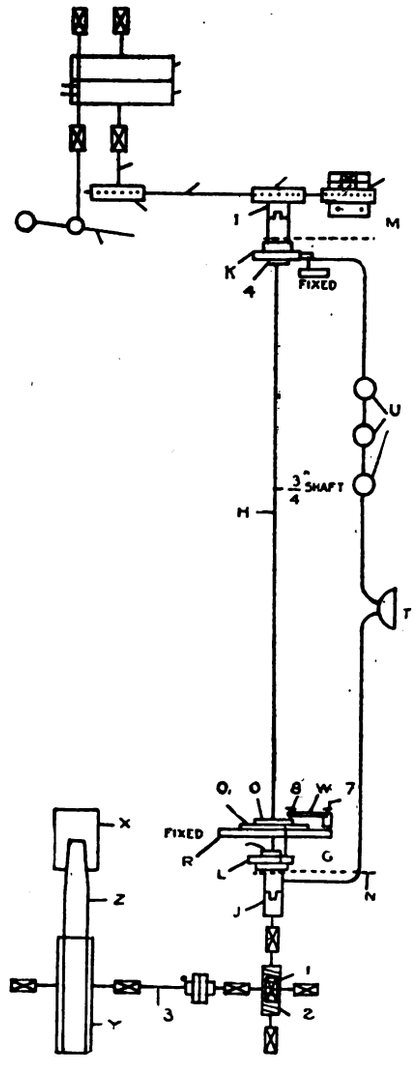


FIG. 3

or ½ degree by previously calibrating the shaft by means of levers N and M clamped to clutches I and J temporarily, M being fixed.

"The power supplied or the in-put being

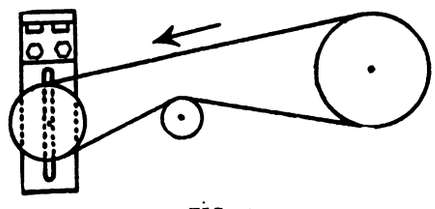


FIG. 4

found and the power absorbed obtained, the efficiency of the worm and worm gear and bearings can be found by dividing the out-put by the in-put. This apparatus appears to be accurate and the simplest and cheapest method of determining the efficiency of worm gears that I have thus far been able to find."

Radical Features of a French Car.

Of the 51 racing machines which were entered in the French Grand Prix race, none were more interesting from a mechanical standpoint than the three Sizaire-Naudin cars .The four cylinders, measuring 78 mm. by 56 mm. bore and stroke, respectively, are cast separately without end walls for the jackets, and on being mounted on the crank chamber are bolted together by a series of longitudinal bolts passing from end to end of the series, and by lugs and short bolts at the top and bottom of each cylinder. This construction not only provides the advantage of separate casting permitting careful verification of the cylinder wall dimensions, but also provides all the advantages of the block casting, since, when bolted together, the cylinders are as rigid as if they were cast in a single piece.

Four valves, two each exhaust and inlet and all 2⅛ inches in diameter, are provided for each cylinder, while but a single ring prevents the flow of the gases past the light steel piston rings. Three spark plugs, two of which are sparked by means of a dual magneto and the third by a single spark Bosch magneto, are positioned in the head of each cylinder and render the ignition certain. Probably more unusual than any of the other details, however, are the constructional details of both front and rear axles. In reality there is no front axle, its place being taken by a single cross spring. No differential is provided on the rear axle which is a solid steel shaft fitted with a single bevel pinion. The pinions of the gear set, which is housed in a casing integral with the rear axle casing, engage with the bevel gear on the solid axle. Four speeds, and each of them providing direct drive, are embraced in the gearset design.

Ohioans Take up Warehouse Trucks.

The Cleveland-Galion Motor Truck Co., of Cleveland, O., which is the title of the recent amalgamation of the two concerns of those names, has departed radically from the previous productions of the separate companies. Instead of gasolene trucks, the Cleveland-Galion company is featuring an electric platform truck, styled the Dynamic warehouse truck. In general design, it follows other contrivances of the sort and resembles a railroad baggage truck; it is equipped with electric power, controlled, as is the steering gear, from a small platform in front, close to the ground. Either front or rear wheels, or all four, can be used for steering.

Defloculated graphite is made by treating graphite with tannic acid. The result is that the graphite becomes so finely divided that it will pass through a filter without being deposited and will remain suspended in water indefinitely.

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MENKER THE STAR AT NARBETH MEET

Kline Pilot Takes Three Events, Including Feature Race, After Blockson Blows Out—Spill Causes Excitement.

John Menker loomed large at the race-meet sponsored by the Belmont Motor Club which occurred on Saturday last, June 29th, on the Belmont Park track at Narbeth, Pa. Of six events, Menker, who piloted a Kline, won three, including the star number—a 50-mile free-for-all.

Most of the excitement of the day was contained in this particular event, which really was run twice. On the first attempt there were four starters—Menken, W. D. Morton in a Mercer, William Freitag in a Fiat, and S. R. Blockson in a Stutz. Blockson was leading at the 18th mile, which he completed in 17:57, when a tire blew out on Morton's Mercer, causing the car to skid through the fence and spill both driver and mechanician. The accident, of course, created great excitement and caused such a rush of spectators to the scene of the mishap that it was deemed the better part of wisdom to stop the race. Neither Morton nor his helper were seriously injured, but their car was hors de combat when the race was restarted. Meanwhile, Freitag's Fiat had contracted motor trouble, and he also was forced to stand down. Blockson and Menker, therefore, were the only starters. The former bore out the promise he displayed in the first attempt and led until the 49th mile, when he suffered a tire blowout which permitted the Kline pilot to win a hollow victory in 53:39. Menker, however, won on his merits in the 10-miles 301-450 class, when he defeated Blockson and Albert Millichap (G. J. G.) in 5:59. Menker's third triumph was scored in the one-mile time trials; he completed the distance in 58 seconds.

The handicap event, 10 miles, went to Freitag, who, giving away starts up to 60 seconds, started from scratch and won without greatly extending himself in 11:20. The remaining events, five miles, 161-230 class, and five miles, 231-300 class, were gathered in, respectively, by Edward Bauer (Buick) and E. Homan (Bergdoll). The summary:

Fifty miles, free-for-all—Won by John Menker (Kline); second, S. R. Blockson (Stutz). Time, 53:39.

Five miles, Class C, for cars with 161-230 inches displacement—Won by Edward Bauer (Buick); second, H. Baker (Carter); third, R. S. Smith, Jr. (Empire). Time, 6:02.

Five miles, Class C, for cars with 301-450 300 inches displacement—Won by E. Homan (Bergdoll); second, W. D. Morton (Mercer); third, Harvey Ringler (Mercer). Time, 6:00⅘.

Ten miles, Class C, for cars with 301-450 inches displacement—Won by John Menker (Kline); second, S. R. Blockson (Stutz); third, A. Millichap (G. J. G.). Time, 9:55.

Ten miles, free-for-all handicap—Won by William Freitag (Fiat), scratch; second, R. S. Smith (Empire), 55 seconds handicap; third, James Gray (Schacht), 60 seconds handicap. Time, 11:20.

One mile, time trials—John Menker (Kline), time, 0:58; William Freitag (Fiat), time, 1:01; William Haupt (Chadwick), time, 1:02.

Dealers Punished for "Stock Car" Ads.

For advertising the victory of Joe Dawson's National car in the 500-mile race on the Indianapolis Speedway as the performance of a stock car, the Wisconsin Auto Sales Co., of Milwaukee, and the Howard Automobile Co., of San Francisco, who are National agents in their respective cities, have been disqualified and suspended until January 1st next by the contest board of the A. A. A.; and for similarly advertising the performance of a Stutz car in the 50-mile race at Salem, N. H., on June 8th, the Empire Motor Car Agency of Boston, Mass., Stutz agents in that city, has been disqualified for a similar period. The action of the contest board was taken under a rule which prohibits the advertising of the performance of a car in a sanctioned event as being the performance of a stock car, unless such events are open only to registered stock cars. The races in question were not so restricted, being Class E, special non-stock events.

A. A. A. Accepts Slower Times as Records.

In line with, but emphasizing the ridiculousness of, its rule which denies intermediate records to any competitor who fails to finish a race, the A. A. A. contest board has eliminated Ralph De Palma and his figures from the table of records set up during the 500-mile race on the Indianapolis Speedway on May 30th last and, inconsistently, has accepted as records the slower times made by men who trailed De Palma for 497 of the 500 miles, Joe Dawson's time for the total distance being the only record which otherwise would not stand to the credit of De Palma. The records booked by the A. A. A. as "official speedway records regardless of class" are as follows:

100 miles	Fiat	Tetzlaff	1:13:37.25
150 miles	Fiat	Tetzlaff	1:49:52.84
200 miles	Fiat	Tetzlaff	2:25:59.52
250 miles	Fiat	Tetzlaff	3:07:13.94
300 miles	National	Dawson	3:48:49.30
350 miles	National	Dawson	4:25:15.27
400 miles	National	Dawson	5:04:14.23
450 miles	National	Dawson	5:44:04.54
500 miles	National	Dawson	6:21:06.03

"Automobile Suicide" Becomes a Reality.

What probably constitutes a record for originality in the application of the motor car to unusual uses was created when Mathias M. Chew, a well known resident of Cecil, N. J., committed suicide one day last week by inhaling gas from the acetylene tank on his car. He was found lying beside the car near his home, with the end of the gas tube held between his teeth.

"ATHLETES" WIN FOURTH VICTORY

Defeat Chicago Automobile Club in Fifth Annual Team Contest—Heavy Penalties for Two Men the Cause.

Following the usual order of things—that is, the order which has been followed in all save one of the five annual interclub reliability tours which have been contested to date by the Chicago Automobile Club and the Chicago Athletic Association, the Cherry Circle team again defeated the Chicago Automobile Club's drivers in the fifth annual event, which was contested on Thursday and Friday last, June 27th and 28th. The total debits of the two teams, which stood at 51 and 53.165 respectively, are more nearly equal than was the case in the 1911 contest, also the penalizations of neither team is so large as last year, due largely to the good condition of the roads encountered during the 240-mile run to Milwaukee and back, and to the ideal weather which prevailed the two days.

The members of the Automobile Club team, 11 in number as against 12 who piloted the cars entered by the Athletic Club members, notwithstanding the fact that they came off second best, really made a very fine showing, for all of the penalties were recorded against but two members. the other nine completing the 240-mile run with clean slates.

The demerits which were tallied against the Athletic team were due to Grower, Gunther, Simpson and Thorne, who stalled motors and were penalized a point each; Wentworth, who had motor trouble and tallied 4 points, and Weatherly, who landed in a ditch and was penalized 43 points. On the C. A. C. team Bosch, who had motor trouble, lost 25 points, and Franklin, who was late at controls, lost 33.

The detailed score is as follows:

Chicago Athletic Association.

	1st Day.	2nd Day.
C. F. Knisely, Diamond T.....	0	0
Frank Wentworth, Rambler...	0	4
W. C. Grower, Diamond T....	1	0
W. C. Thorne, American.....	0	1
A. H. Gunther, Cadillac.....	1	0
W. Chamberlain, Rambler.....	0	0
C. A. Griggs, Chalmers.....	0	0
S. F. Weatherly, Pathfinder...	0	43
Harold Boulter, Locomobile...	0	0
W. Simpson, Winton.....	0	1
L. Jacques, Peerless.....	0	0
S. E. Hibben, Packard.....	0	0

Total, 51 points.

Chicago Automobile Club.

Allan S. Ray, Stearns.....	0	0
G. F. Ballou, Apperson.....	0	0
Charles Bosch, Stearns.....	25	0
J. T. Brown, Velie.....	0	0
R. O. Evans, Apperson.....	0	0
H. A. Ford, Premier.....	0	0
E. T. Franklin, Abbott-Detroit	33	0
G. F. Griffin, Peerless.....	0	0
W. M. Jones, Winton.....	0	0
F. E. Mann, Locomobile.....	0	0
R. B. Wilson, Knox.....	0	0

Total, 58 points.

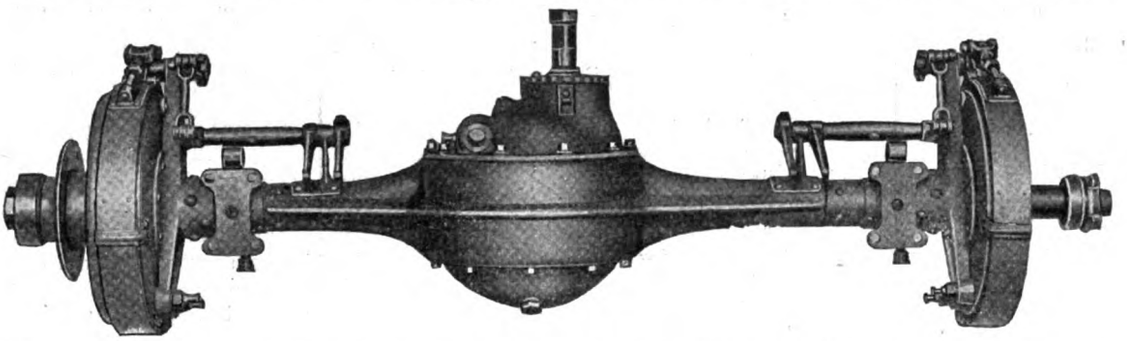
Fractional penalization, 53.165.

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American American

American Axles

Have Universal Application to Either Gas or Electric Cars Using Bevel or Worm Gears



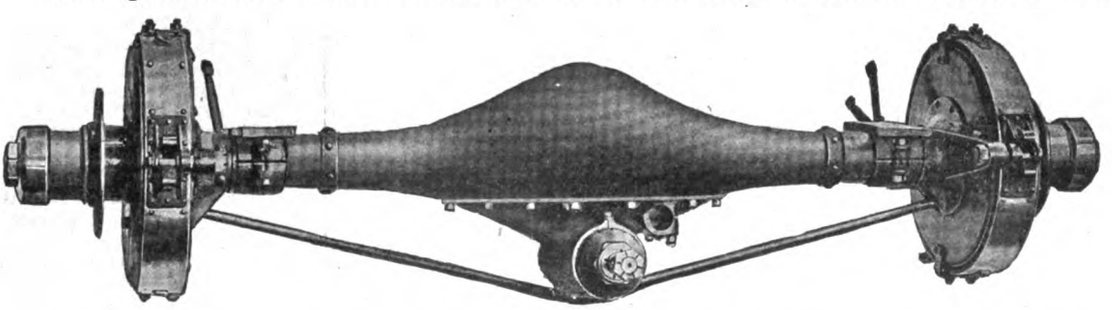
Whatever the type of pleasure car or truck to be equipped, there is an *American* axle for it that demands your consideration because of its sheer merit.

You now have the option of the two types of gear that have won first place in this country and England respectively.

The addition of the Lanchester Worm Gear to the *American* line of bevel gear axles instantly made *American* the synonym for axles of the highest quality for all classes of cars.

For any car weighing up to 4,500 pounds, and up to 60 H. P., there is an *American* axle of superb design, thoroughly tested model and finest workmanship, with either bevel or worm gear.

Through the Warner Gear Co., of Muncie, Ind., we hold the exclusive American rights as axle manufacturers to the use of the Lanchester Worm Drive.



THE AMERICAN BALL-BEARING CO.

Edgewater Park and L. S. & M. S. Ry. CLEVELAND, OHIO

American

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1,010,754. Internal Combustion Engine. Allen E. Hall, Philadelphia, Pa. Filed Mar. 14, 1911. Serial No. 614,298.

1. In an internal combustion engine, the combination with a cylinder, of a piston in the cylinder, an exhaust valve in the head of the cylinder having a tubular stem, a source of cooling agent supply, a hollow rod telescoping in the tubular stem of the exhaust valve and connecting the exhaust valve and the piston, said rod communicating at one end with the cooling agent source of supply, substantially as described.

1,010,798. Internal Combustion Engine. Adolph Potdevin, Brooklyn, N. Y., assignor to Potdevin Machine Company, Brooklyn, N. Y., a Corporation of New York. Filed Jan. 4, 1911. Serial No. 600,699.

1. In an internal combustion engine of the two-cycle type, the combination with a piston, of a cylinder therefor having an explosion chamber and an exhaust chamber, the former chamber having therein primary and secondary exhaust ports and a gas inlet port, the secondary port communicating with the exhaust chamber and the several ports being of progressively increasing areas, whereby the piston itself in its outer or power stroke first partially opens the primary exhaust port, then the gas inlet port, and then the secondary exhaust port, all the said ports being fully open when the piston reaches the limit of its said stroke.

1,010,803. Detachable Wheel. Victor Riley, Hollybank, Coventry, England. Filed Sept. 7, 1911. Serial No. 648,194.

The combination with a detachable hub carrying a nut free to turn in it and provided with a pawl adapted to engage with a ring of teeth in it; of a cover pivoted to the nut and adapted to be turned over the pawl and to hold it in engagement with the teeth and means for controlling the movement of the cover in such manner that when it is not above the pawl it projects beyond the periphery of the nut.

1,010,806. Indicating Tail Lamp. Maurice S. Rosenfeld, New York, N. Y., assignor to The Warning Signal Lamp Company, New York, N. Y., a Corporation of Maine. Filed Aug. 26, 1910. Serial No. 579,166.

1. An indicating tail lamp comprising: a frame, and means adapted to secure the same to the vehicle; a horizontal base secured to said frame, and suitable lamps carried by the same at the opposite ends thereof; a box to receive light therefrom and resting upon said base, and mechanism within said box to display a suitable warning; and detachable chimneys for each of said lamps adapted to secure the said box to the said frame.

1,010,883. Wheel Brake. Samuel D. Forman, Tonopah, Nev. Filed Mar. 12, 1910. Serial No. 548,930.

In combination a wheel hub, a sleeve rotatably mounted on the hub, spokes radiating from the sleeve, a wheel guard mounted on the terminals of the spokes, an arm connected with the sleeve, a link connected with the arm, a lever pivotally supported and pivoted to the link, stops secured on the wheel guard at radially spaced points, and arms adapted to engage the stops to limit the movement of the wheel guard on the hub in either direction.

1,010,884. Cross Chain for Anti-Skid Devices. Floyd Henry Fox, New York, N. Y. Filed July 18, 1910. Serial No. 572,563.

1. A link for a cross-chain of an anti-skid device for tires comprising a body portion having a circular opening formed therein and a bearing stud secured in said opening, the side edges of the body portion being inturned and bearing against opposite sides of the bearing stud.

1,010,885. Anti-Skid Chain. Floyd Henry Fox, New York, N. Y. Filed Aug. 20, 1910. Serial No. 578,147.

1. A cross chain of an anti-skid device for tires, having therein a link comprising a body portion having an opening therein and side wings bent upward and inward, and a bearing stud comprising a head having its sides bearing against the side wings and having at its lower end a projection extending into and secured in the opening in the body portion of the link, the end of said projection being flush with the lower face of the central portion of the link, the bearing stud also having a shoulder formed in its head and a tongue on the body portion of the link curved downward below the plane of the central portion of the link and then upward and inward to form a loop, with its end resting on the shoulder formed on the head of the bearing stud.

1,010,904. Carburetter. William Andrew Harris, Greenville, S. C. Filed Feb. 3, 1911. Serial No. 606,299.

1. In a device of the character specified, a receiver, means for supplying air to the receiver, said means comprising a casing, a movable bell for the casing, a water seal between the bell and the casing, a cylinder arranged concentric within the casing, a piston in the cylinder, a rod connecting the piston with the bell, and means for alternately admitting water to the cylinder and discharging it therefrom to raise and lower the bell, said means comprising a valve casing having at one end a passage for connection with a water supply and having at the other end a connection with the cylinder, the valve casing having a discharge opening, a valve in the casing having means for connecting the first-named passage with the second-named passage, or with the discharge opening, a disk journaled on the valve, a roller extending laterally from the disk near each side thereof, a vertically movable rod having a finger for engaging the roller to oscillate the disk, a counterbalance connected with the disk for completing the movement thereof, a connection between the disk and the valve for moving the same, stops for limiting the movement of the disk, a sleeve on the bell of the casing through which the rod is slidable, a stop adjustable on the rod on each side of the sleeve, a pump for supplying gasolene to the receiver, means on the bell of the casing for operating the said pump, means for controlling the supply of water to the valve, and means controlled by the volume of the contents of the receiver for actuating the said water controlling means.

1,010,935. Clutch. Mark D. Meek, Eau Claire, Wis. Filed Sept. 22, 1910. Serial No. 583,255.

1. A clutch comprising a driving element, an interiorly grooved ring carried at one end of the element, a hollow shaft, keyed to ing the element, a driven element, keyed to the shaft, a plurality of outwardly flaring V-brackets arranged circularly against the inner side of the driven element and projecting into the ring, pairs of links hinged between the V-brackets, shoes hinged upon the links midway of their ends, friction blocks carried in the shoes and seating in the groove of the ring, a collar loose upon the shaft within the ring, a band rotatable in the collar, arms connecting the outer ends of the links to the band, and a movable rod arranged in the shaft and having connection with the collar for moving the same.

1,010,965. Headlight for Vehicles. Anton Seuss, Pittsburgh, Pa. Filed Apr. 21, 1911. Serial No. 622,560.

In a lamp shifting mechanism for automobiles, brackets positioned upon the inner sides of the frame of the vehicle and each consisting of inwardly projecting arms provided with vertically alining perforations, a boss upon the outer face of the upper of said arms and provided with a ball race, a pin revolubly supported by said arms and extending through said perforations, a head upon said pin, said head provided with a ball race opposing the ball race in the boss carried by the upper of said arms, antifriction members interposed between the head and the boss in said races, lamp supporting arms carried by the said head, and means for shifting in unison the pins carried by the arms of said brackets.

1,010,968. Vehicle Top Fastener. William Spickernagle, Owensboro, Ky. Filed Feb. 6, 1911. Serial No. 606,869.

1. A canopy fastener comprising a supporting frame provided with pendent lugs, said lugs being provided with oppositely disposed transverse grooves, latch casings carried by a vehicle seat, latching bolts in said casings having end slots for interlocking engagement with the grooves of said lugs, supporting tubes for said casings, rods extending through said tubes and having crank arms for operating said bolts, springs coiled about said rods and opposing rotating of the same in one direction, connecting rods, links connecting the last-mentioned rods to the bolt operating rods, crank arms carried by the connecting rods, a hand lever, and link connections between said hand lever and the last-mentioned crank arms.

1,010,974. Ball Retainer. Jackson L. Straub, Lancaster, Pa., assignor to The Star Ball Retainer Co., Lancaster, Pa., a Corporation of New Jersey. Filed Oct. 7, 1910. Serial No. 585,889.

1. A ball retainer and separator for ball bearings consisting of a base-ring with spaced standards rising from one of its edges, the free ends of the standards overhanging said base, the latter being corrugated, thereby providing ball-seating depressions between the standards, said depressions extending transversely of the axis of the ring and having the effect of increasing the length of the standards and lessening the distance therebetween.

1,010,980. Vehicle Tire. Ellsworth Tallman, Morley, Iowa. Filed Apr. 28, 1911. Serial No. 623,855.

1. A vehicle tire, having a rim provided with a plurality of hinge pin sections; a plurality of juxtaposed U-shaped metal spring members, said members being provided with hook-shaped ends adapted to engage said hinge pin sections; and a plurailty of latches for locking said hinge pin sections within said hook shaped ends.

1,010,987. Make-and-Break Sparker for Internal-Combustion Engines. Elihu Thomson, Swampscott, Mass., assignor to General Electric Company, a Corporation of New York. Filed Aug. 17, 1907. Serial No. 388,979.

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1. The combination with the cylinder of an internal combustion engine, of a removable spark-plug comprising a movable insulated abutment, sparking contacts controlled thereby, and means for imparting impulses to said abutment from a source outside of said cylinder.

1,011,013. Vehicle Tire. Asplan Beldam, Baldock, England. Filed Sept. 14, 1911. Serial No. 649,337.

1. In combination, a wheel, spaced apart blocks formed with openings, and mounted on the rim of the wheel, springs mounted in the openings and extending beyond the outer plane of the blocks, a tire supporting rim mounted on the springs, a tire secured to the tire supporting rim, abutments extending inwardly from the tire supporting rim, abutments extending from the rim of the wheel, projections extending from two adjacent abutments on the wheel rim and engaging the opposite side of one of the abutments on the tire supporting rim, springs between the abutments on the tire supporting rim, and the abutments on the wheel rim to provide cushions, and side plates extending from the rim of the wheel to the tire supporting rim to inclose the springs.

1,011,051. Speedometer. Louis A. Greenleaf, Dorchester, Mass. Filed June 9, 1910. Serial No. 566,034.

1. A speedometer comprising an inclosure, a continuous hollow cylindrical member therein, means for holding said member in spaced apart relation to the walls thereof to leave an open annular space, air current producing means wholly within said cylindrical member, a driving connection thereto, and means also wholly within said cylindrical member responsive to an air current and having connected thereto a device to indicate the force thereof, said parts being constructed and arranged to produce a closed circulation of air in the direction through the interior of said cylindrical member, returning in the opposite direction through said unobstructed open annular space.



INDEX TO ADVERTISERS



A

Abbott Motor Car Co. ... 70
Adamson Mfg. Co. ... 64
Ajax-Grieb Rubber Co. ... 54
American Ball Bearing Co. ... 55
American Motors Co. ... 71
American Starter & Carburetor Mfg. Co. ... 67
Argo Electric Vehicle Co. ... 62
Atwater Kent Mfg. Works ... 54
Automobile Supply Mfg. Co. ... 72

B

B & L Caster Axle Co. ... 68
Badger Brass Mfg. Co. ... 70
Bantam Anti-Friction Co. ... 67
Barthel, Daly & Miller ... 62
Bartholomew Co. ... 60
Benz Auto Import Co. ... 65
Billings & Spencer Co. ... 17
Bosch Magneto Co. ... 63
Bossert Co. ... 53
Bower Roller Bearing Co. ... 67
Bretz Co., J. S. ... 64
Briggs-Detroiter Co. ... 66
Brown-Lipe-Chapin Gear Co. ... 67
Bush Mfg. Co. ... 62

C

Cartercar Co. ... 66
Century Electric Motor Car Co. ... 68
Champion Ignition Co. ... 67
Champion Spark Plug Co. ... 69
Clark-Carter Automobile Co. ... 65
Colonial Electric Car Co. ... 70
Consolidated Mfg. Co. ... 64
Continental Motor Mfg. Co. ... 53
Covert Motor Vehicle Co. ... 65
Cox Brass Mfg. Co. ... 67
Cramp, Wm., & Sons, Ship & Engine Building Co. ... 69

D

Dahl Punctureless Tire Co. ... 10
Dayton Auto Truck Co. ... 55
Dayton Rubber Mfg. Co. ... 53
Dean Electric Co. ... 5
Detroit & Cleveland Navigation Co. ... 70
Diamond Chain & Mfg. Co. ... 58
Diamond Rubber Co. ... 69

E

Electric Welding Products Co. ... 69
Empire Automobile Co. ... 70
Empire Tire Co. ... 68

F

Fedders Mfg. Works ... 61
Federal Miniature Lamp Works ... 54
F. I. A. T. ... 70
Firestone Tire & Rubber Co. ... 72
Ford Motor Co. ... 71
Franklin Automobile Co. ... 71

G

G. C. A. Mfg. Co. ... 67
Goodyear Tire & Rubber Co. ... 54
Grant-Lees Machine Co. ... 53
Great Northern Hotel ... 60
Grossman Co., Emil ... 53

H

Hartford Auto Parts Co. ... 1
Hartford Suspension Co. ... 54
Havers Motor Car Co. ... 66
Haynes Automobile Co. ... 70
Henderson Motor Car Co. ... 65
Hodge & Graves Co. ... 69
Howard Demountable Rim Co. ... 53
Hupp Motor Car Co. ... 71
Hyatt Roller Bearing Co. ... 69

I

Ignition Starter Co. ... 62
Inner Shoe Tire Co. ... 54
International Accessories Corp. ... 67
Inter-State Automobile Co. ... 65
Invincible Starter Co. ... 64

J

Jackson Automobile Co. ... 66
Jeffery-Dewitt Co. ... 72
Jencick Motor Corp. ... 55
Jones & Co., Phineas ... 69
Jones Recorder ... 72

K

Kellom Co., Chas. F. ... 54
Kelly-Springfield Tire Co. ... 57
King Motor Car Co. ... 71
Kinsey Mfg. Co. ... 68
Kissel Motor Car Co. ... 8
Kline Motor Car Corp. ... 65
Knight-Davidson Co. ... 68
Knox Automobile Co. ... Inside front cover

L

Lauth-Juergens Motor Car Co. ... 63
Leather Tire Goods Co. ... 53
Locomobile Co. ... 54
Lovell-McConnell Mfg. Co., Inside back cover

M

Mais Motor Truck Co. ... 66
Mayo Radiator Co. ... 3
McCue Co. ... 16
McGraw Tire & Rubber Co. ... 53
Metz Co. ... 54
Michigan Buggy Co. ... 68
Michigan Crank Shaft Co. ... 54
Miller, Chas. E. ... 3
Mosler & Co., A. R. ... 53
Moss Photo Engraving Co. ... 57
Motor Car Equipment Co. ... 54
Mott Wheel Works ... 72
Motz Tire & Rubber Co. ... 54
Mutty Co., L. J. ... 54
M & P Electric Vehicle Co. ... 4

N

National-Acme Mfg. Co. ... 59
National Gas Engine Starter Co. ... 6
National Motor Vehicle Co. ... 71
New Departure Mfg. Co. ... 14
Niagara Sales Co. ... 17
Nordyke & Marmon Co. ... 66

O

Owen & Co., R. M. ... 54

P

Parish & Bingham Co. ... 64
Penn Spring Works ... 53
Pennsylvania Rubber Co. ... Front cover
Perfection Spring Co. ... 53
Piel Co., J. ... 9
Prest-O-Lite Co. ... 12-13
Pullman Motor Car Co. ... 66

R

R. C. H. Corporation ... 55
Remy Electric Co. ... 55
Republic Rubber Co. ... 53
Royal Equipment Co. ... 72

S

Schrader's Sons, A., Inc. ... 58
Shawmut Tire Co. ... 70
Sheldon Axle Co. ... 2
Smith Co., A. O. ... 72
Sparks-Withington Co. ... 59
Speedwell Motor Car Co. ... 65
Splitdorf Electrical Co. ... 64
Springfield Metal Body Co. ... 54
Standard Roller Bearing Co. ... 54
Stearns Co., F. B. ... 66
Stewart & Clark Mfg. Co. ... 15
Studebaker Corporation ... Back cover

T

Timken-Detroit Axle Co. ... 7
Tobias, F. H. ... 53
Twitchell Gauge Co. ... 61
Typhoon Signal Co. ... 53

U

United Rim Co. ... 72
United States Tire Co. ... 64

V

Valentine Co., J. H. ... 60
Volkmar Auto Starter Co. ... 69

W

Warner Gear Co. ... 55
Warner Instrument Co. ... 63
Weed Chain Tire Grip Co. ... 54
Western Motor Co. ... 64
Willard Storage Battery Co. ... 53
Willys-Overland Co. ... 18
Winton Motor Car. Co. ... 71
Wisconsin Motor Mfg. Co. ... 71
Woodstock Hotel ... 63

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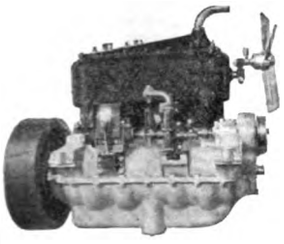
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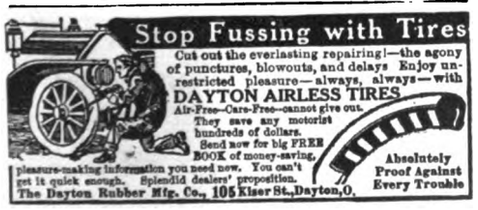
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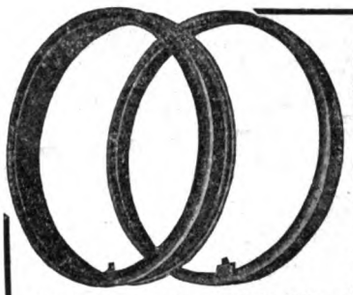
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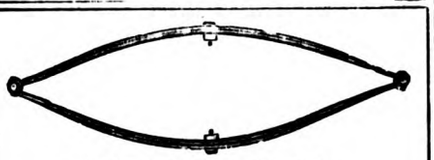
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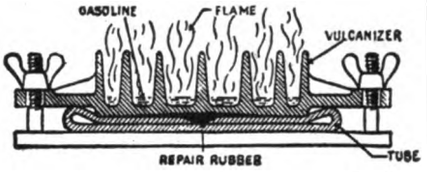
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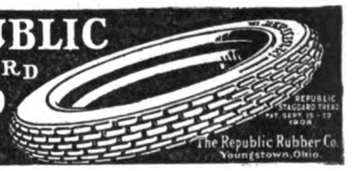


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ATWATER-KENT MFG. WORKS
46 North Sixth St., Philadelphia, Pa.

Reo the Fifth

Final and crowning achievement of R. E. Olds, pioneer designer of autos. A standard size 30 to 38 horsepower four cylinder car of modern refinements priced for the present at only $1,055.

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$495.00 METZ 22 H. P. MOTOR CAR

The most economical car you can buy at any price. The Metz will run from 28 to 32 miles on a gallon of gasoline, over 100 miles on a pint of lubricating oil, and from 8,000 to 10,000 miles on a set of tires. You can secure exclusive sale of these cars in your territory. Book "B" mailed free on request.

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All Standard Bearings
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Send for it.
Standard Roller Bearing Company
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"The Best the World Affords"
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AJAX TIRES
Guaranteed 5000 Miles
Ajax-Grieb Rubber Company
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75% Increase in Tire Efficiency
That's what the INNERSHU accomplishes. It's a tough, durable, rubberized fabric formed permanently to tire shape. Ask for circular.
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OF EVERY DESCRIPTION
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This Name on Automobile Tires and Rubber Accessories Signifies Inherent Qualities of Material and Workmanship that Insure the Maximum of Service at the Minimum of Expense. (340)
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FEDERAL MINIATURE LAMP WORKS
of the General Electric Co.
Cleveland and Chicago

Locomobile Cars for 1912
Complete information furnished on request.
The Locomobile Company
BRIDGEPORT, CONN.

We Specialize on
Finishing Crank Shafts
Only.
MICHIGAN CRANK SHAFT CO.
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Shock Absorber
HARTFORD SUSPENSION COMPANY, 184 Bay St., Jersey City, N. J.
EDW. V. HARTFORD, Pres.
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The Only Exclusive Wholesale Automobile Supply House
Write for Our Complete Catalog and Revised Discount Sheet
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MOTZ Cushion Tires
For Pleasure Cars and Light Delivery Cars
Send for Booklet 58
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Executive Office: Akron, Ohio
BRANCHES:
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1409 Race St., Philadelphia 2352 Euclid Ave., Cleveland
Standard Tire & Rubber Co., 104-106 Portland St., Boston
Distributors for New England States

A—Shows *double*, notched treads.
B—Shows undercut sides.
C—Shows slantwise bridges.
D—Shows absorbing means when passing over an obstruction.

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DAYTON TRUCKS are made in 2, 3 and 5 ton models. They hold a world's record for durability, reliability, and efficiency. Write for Catalog.

DAYTON AUTO TRUCK CO., Dayton, Ohio

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We are determined to build the best all-'round five-passenger touring car in the world and sell it, completely equipped, for

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BROADWAY 197 HOME 63479

SUNSET AUTO CORPORATION

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Havers Six Cylinder 40 H P — $1850.00
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Cass Motor Trucks

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The Remy Magneto Co.
Anderson, Ind.

Gentlemen:-

Mr. Rundy who handles the Remy Service Department for the Auto Motor Equipment Co., of this city, has called upon us several times. We have been using Remy Magnetos on our Nyberg line, for several months, and as yet have had been getting satisfactory service from your Magnetos without any attention, whatsoever.

Sincerely yours,
Sunset Auto Corporation.
By. F. Rogers

A postal will bring scores of letters like these
Remy Electric Co
Anderson, Ind

Dependable Deliveries



DELIVERY dates are of utmost importance. Delay in shipments means loss of money.

We guarantee prompt deliveries.

Warner Quality and Warner eight-year old reputation for making highest class gears is back of the product.

Car makers interested in the Quality and Merit that means absolute safety and satisfaction will do well to write.

We modify our designs to meet detail requirements, or build to approved designs on seasons quantity specifications.

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Warner Gear Co.
Muncie - Indiana

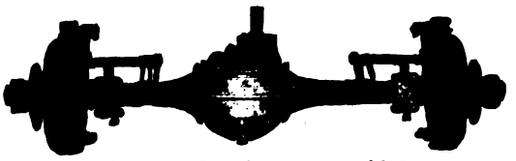
Jencick Motors

OF QUALITY

FOR MOTOR TRUCKS

Jencick Motor Corporation
PORTCHESTER, N. Y.

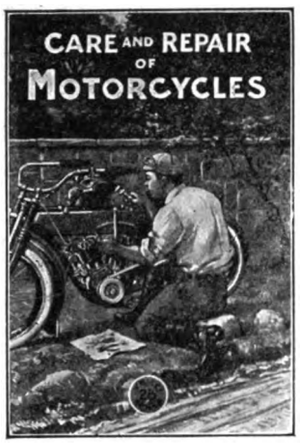
American AXLES



Write today for our booklet

THE AMERICAN BALL-BEARING COMPANY
Cleveland, Ohio

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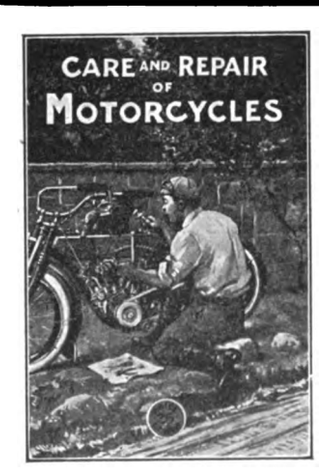
A trouble saver for the motorcyclists



This book contains more practical advice for the rider, more good hard sense, more suggestions as to how to keep out of trouble, and how to get out of it, than has ever been printed heretofore in any one book.

¶ It fits the coat pocket and it includes free engine clutches, two-speed gears, mechanical lubricators and magnetos, together with special matter on motors, valves, carbureters, fuel and important general subjects, all plentifully illustrated.

¶ Dealers and jobbers in all parts of the country are selling "Care and Repair of Motorcycles" to both new riders and veterans as the best aid in correcting and avoiding motorcycle trouble.



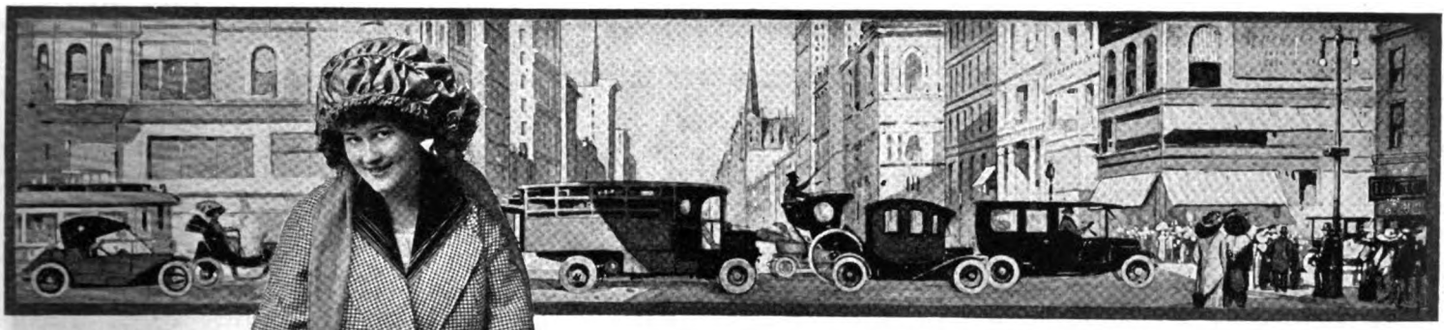
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Special Rates to Jobbers and Dealers on Quantity Orders.

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Kelly-Springfield Tire Company
20 Vesey St., New York

Branch Offices in
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Boss Rubber Co.
Denver, Colo.

Appel & Burwell
Rubber & Tire Co.
Dallas, Texas

Todd Rubber Company
New Haven, Conn.

Bering Tire & Rubber Co.,
Houston, Texas

The desire to make good tires plus the ability to make good tires—makes good tires

That is all there is to the tire question.

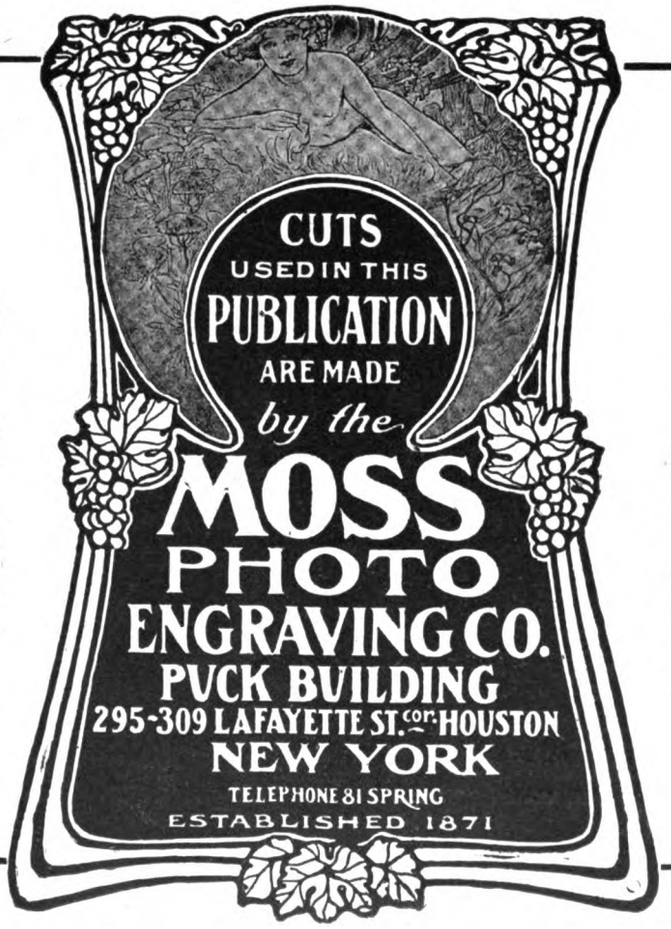
Some other man's mileage won't make your tires last any longer. The longevity of good tires depends upon the conditions under which they are used, the way the car is handled, the kind of roads it travels and the weights that must be carried.

Constructive principles are pretty much the same; therefore, in selecting tires, it is well to go back to first principles and find out who wants to make good tires and who can.

This company was the first to make rubber tires to take the place of iron tires on all vehicles, and it has been making rubber tires of various kinds ever since. The Kelly-Springfield solid tire has had a longer but not a greater success than the

Kelly-Springfield
Automobile Tire

Kelly-Springfield Tire Company, 20 Vesey Street, New York



OUR REPUTATION

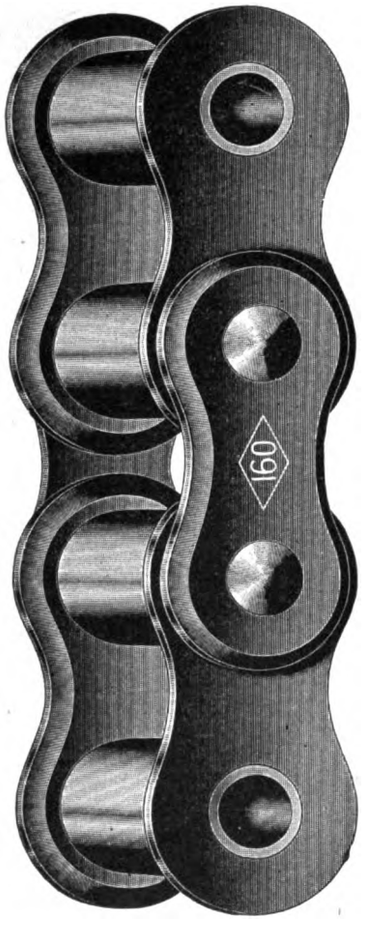
is based on the fact that we have been handling the engraving of several prominent trade and general publications for years to the utmost satisfaction of both publishers and advertisers

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A prominent automobile manufacturer says:



"We have used Diamond Chains for years. We are pioneers of solid tired vehicles and Diamond Chains have pleased our customers. I do not hesitate to tell you that they are our sole standbys."

This is what the sales manager of a large automobile manufacturer wrote an interested engineer on the above subject.

Twenty-two years of progressive development and constant supremacy in the manufacture of machined chains enable us to offer to Diamond Chain users a chain of long life and absolute reliability.

Diamond Chains must test up to a fixed high standard before leaving our factory, and this test invariably involves a duty greater than that for which the chains are designed and sold. Our engineering department will advise freely on design problems. Write for our treatise "Power Chains and Sprockets."

TRADE ◇ MARK

DIAMOND CHAIN & MFG. CO.
155 W. Georgia St., Indianapolis, Ind.
CAPACITY 8,000,000 FEET PER YEAR (128)

Mr. Automobilist:

Your tire maker is very anxious to impress upon you the importance of

Tires Inflated to the Right Pressure

He insists that this is tire economy and

Saves You Money

How do you know what pressure you have in your tires? A

SCHRADER
UNIVERSAL
Tire Pressure Gauge

(Trade Mark Registered in U. S. Patent Office)



(Patented March, 1898—Other Patents Pending)

will tell the exact pressure in your tires at any time, day or night, by simply holding this Gauge to your Valve for a second. Its recording sleeve remains in place, showing the exact pressure in the tire so that the Gauge can be taken anywhere and read, at night to the front of the car into the light of the lamps. After the pressure has been ascertained the Indicating Sleeve can be pushed back into the Gauge with your finger. No catches or snaps to operate or get out of order. This Gauge is 2½ inches long over all, short enough to apply easily to the smallest diameter of wheel and can easily be carried in the vest pocket or the change pocket of your trousers.

Price $1.00 Each
Ready for Delivery Now

Guaranteed Simple and Absolutely Accurate

Can be obtained from all tire manufacturers and the dealers, or

A. SCHRADER'S SON, Inc.
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Light and Heavy Special Milled Automobile Products

WE ARE prepared to complete all operations that make your parts special, on work up to two and one-half inches in diameter and ten and one-half inches in length.

Send in your samples or specifications and see for yourself the reasonable prices and prompt service you will obtain by using NAMCO products.

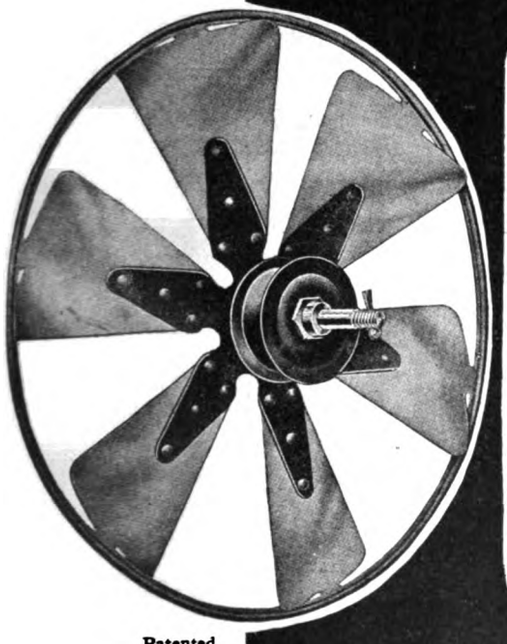
Our customers can order for immediate delivery from our stock at all factories and warehouses a complete line of A. L. A. M. Nuts and Screws. A contract with us on these standard products will save you money. Booklet.

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Automatic Screw Machines and Their Products

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CHICAGO, 23 So. Jefferson St. ATLANTA, 3rd National Bank Bldg. MONTREAL.



Patented

1913 Fans

Before considering your next season's requirements ask for results of tests recently conducted with Sparks-Withington One Piece Blade Radiator Fans. This information will be furnished gladly, and it may mean improvement to your cooling system.

Our Capacity 1,000 Fans Per Day

Get Catalog

The Sparks-Withington Co.

Jackson, Michigan and Walkerville, Canada

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Ask for Agency

Learn From the Book—Why the Glide is Best

If you are contemplating the purchase of an automobile you can make no mistake going to a "Glide" dealer. In the first place, a "Glide" dealer has a car that he can sell with absolute confidence and with the knowledge that the automobile will give

5 to 7 Years' Service

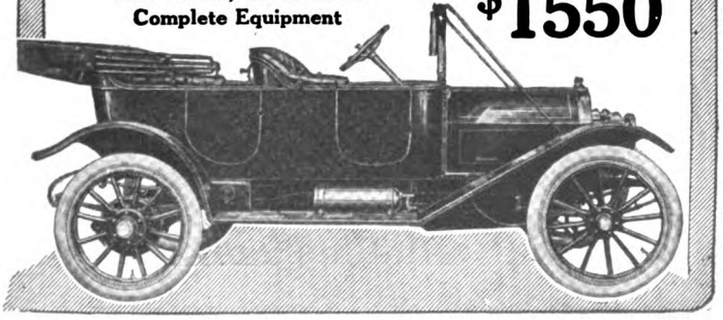
Then again he knows that his customer becomes the purchaser of a car that combines quality and price in a way that has never been equalled by any automobile manufacturer.

If these things count for anything—and they surely do—then the "Glide" has a perfect right to call itself the *best* car—and the best car is the car you want. You can learn all about the "Glide" and the *guarantee* back of it from the handsome book we send free to all those interested. Booklet pictures and describes full line including Two and Four Passenger 45 h. p. cars, $2,000; Five Passenger "45" $2,150; Seven Passenger, "45" $2,250.

To Dealers: We intend to establish a few new selling agencies in territories which are still open. Write for our proposition. The "Glide" has made good for other dealers—it will make good for you. Write for information today.

THE BARTHOLOMEW COMPANY
220 Glide Street Peoria, Ill.

New Model, 36-42 H. P.
Complete Equipment **$1550**



Self Starter HANNA A

Watch the Prices Drop!

Just as the Hanna self starter—the only 100% efficient self starter that does not foul or soot your plugs—was imitated by those who followed our lead so now is the price of the Valentine manifold starter being met.

Remember We Were the Originators

Not only were we the first to produce an acetylene self starter but we were first to introduce a manifold self starter at the right price, $10.

Our Price Does Not Cut the Dealer's Profit

Still some fine territory open. The profit is big. Our goods are right and fully guaranteed. Write today.

J. H. VALENTINE COMPANY
Syracuse, New York

The Valentine STARTER MANIFOLD and Gas Lighter

Great Northern Hotel
CHICAGO

Ideal Headquarters for Automobilists

Rates:
Without Private Bath
$1.50 and $2.00
With Bath
$2.50 to $4.00



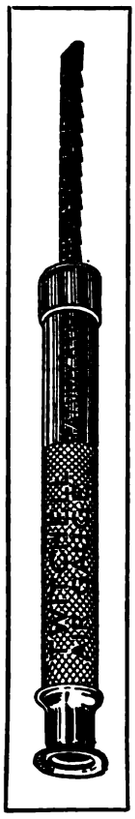
Large, Comfortable Rooms
Grill Room Popular Prices
Cafe on Parlor Floor

Service and Appointments Most Approved

Most centrally located hotel in Chicago and absolutely of fireproof construction.

Jackson Blvd., Dearborn and Quincy Sts.
JOHN C. ROTH, Managing Director

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Mr. Automobile Owner: We find in the different advertising matter put out by infringing competitors, the statement that their air gauge has no **snaps** or **catches** to get out of order.

No, they haven't, but they do have **rubber washers** and **rubber bags,** which as you know, will deteriorate and harden so that in three or four months the gauge is worthless. Besides the tube is held by friction, and you know that where there is friction, there is wear.

Now the TWITCHELL does not have rubber washers or bags to deteriorate. There is no tube controlled by friction to wear, consequently giving you incorrect pressure. The TWITCHELL is positively accurate at all times and the only way that you can put it out of commission is with a **hammer.**

The Twitchell Air Gauge

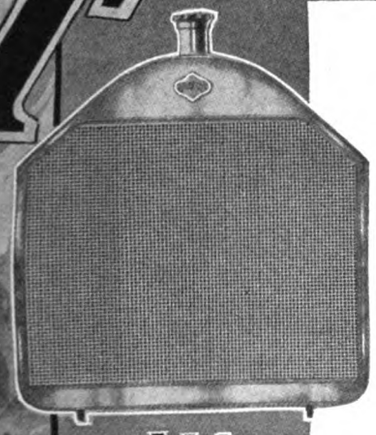
tells you in a minute if your tires are properly inflated. That is why the TWITCHELL AIR GAUGE is tire insurance; that is why it is a guarantee of maximum tire efficiency.

You simply apply the gauge to your valve and the indicator shows your tire pressure. A stop holds the indicator in place till you release it. On every gauge is a table of pressures different size tires require.

Price $1.00 Each **NOW READY FOR SHIPMENT**
Can be obtained from your dealer

THE TWITCHELL GAUGE CO., 1256 Michigan Ave., Chicago

Fedders SQUARE TUBE RADIATORS



ALL FOUR SIDES SURROUNDED BY WATER

Efficiency, service and economy are the chief characteristics of Fedders square tube radiators.

All four sides of each pure copper tube surrounded by water make a Fedders square tube radiator perfectly efficient in the performance of its cooling function.

The water space between the tubes being reasonably wide, there is little or no danger of a Fedders square tube radiator ever becoming clogged up—this means perfect service. It also means economical service for Fedders square tube radiators always cool their engines; that is, if the engines are normal.

Any tinsmith can repair a damaged Fedders square tube radiator at little or no cost. Most other radiators must be shipped to the radiator factory to be repaired. More Fedders economy.

Wire us for more detailed information. While the square tube is our leader, we are in position to make almost any type radiator desired. Send us your blue prints and specifications and let us quote you.

FEDDERS MANUFACTURING WORKS, Buffalo, New York

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The ONLY Starter Plug

It was almost impossible to put the simple, successful acetylene gas starter on cars without petcocks UNTIL THIS new plug was perfected.

NOW you can put a self starter of the type of the DISCO on FORDS, BUICKS, ELMORES, and all cars whether they have petcocks or not. This is the ONLY STARTER PLUG. Patents pending.

Takes the place of all other spark plugs. Gives splendid ignition results—withstands heat, is soot proof and easily accessible for cleaning and inspection.

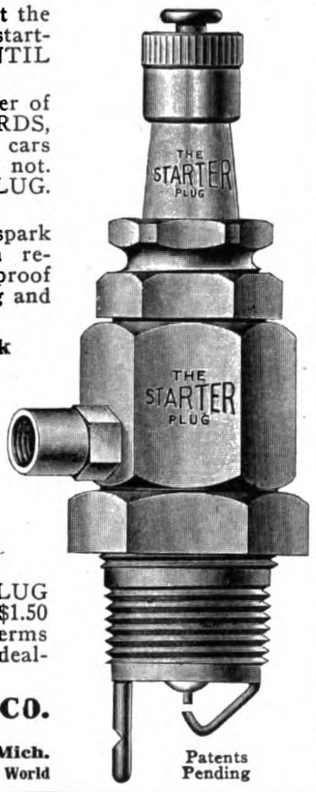
Look For This Trademark

THE STARTER PLUG
Manufactured By J E SCHAEFER
Exclusively for IGNITION STARTER CO. DETROIT U.S.A.

on every box.

FOR SALE TO EVERYBODY
FOR SALE BY EVERYBODY

You can buy the STARTER PLUG from any live dealer. Price $1.50 each. We will quote prices and terms to manufacturers, jobbers and dealers. Write us.



Patents Pending

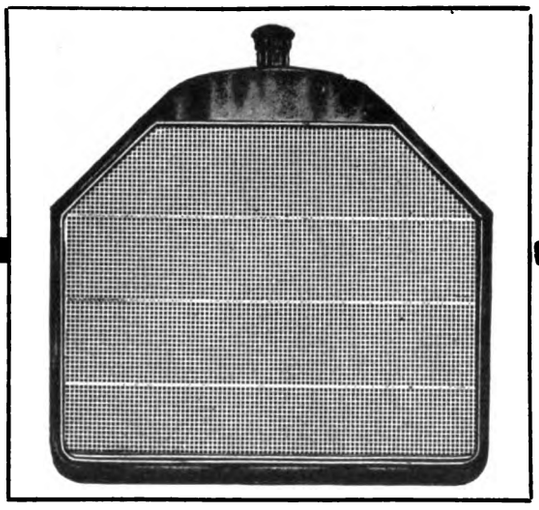
IGNITION STARTER CO.
Spark Plug Department
615 Dodge Building Detroit, Mich.
Largest Makers of Self Starting Devices in the World



Schafer Ball Bearings

are built to withstand the most extreme strains and stresses of hardest service.. The durable, wear-resisting chrome steel used in their construction is of exclusive analysis, free from blisters, air bubbles and every intrinsic weakness that might cause the balls to vary in weight, size or structural strength. The balls are uniform to within .0001 part of an inch and remain so over long terms of hard service. Recognized by engineers as the highest grade and finest quality of anti-friction bearings made today. When you equip with Schafer you insure your car against frictional deterioration.

Barthel, Daly & Miller
42 Broadway, New York City



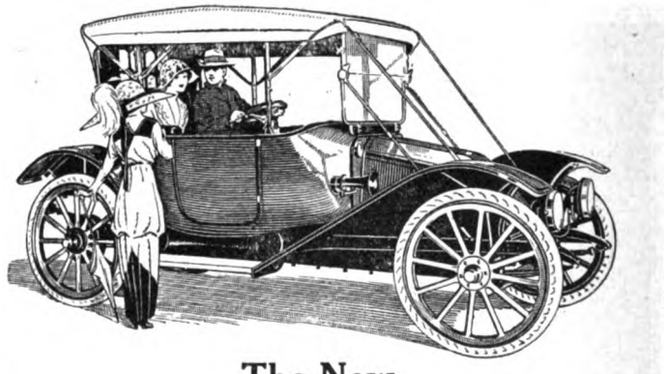
THE BUSH RADIATOR

IN EFFICIENCY—The Highest
IN APPEARANCE—The Finest
IN CONSTRUCTION—The Simplest
IN SERVICE—The Most Satisfactory

"The Most Practical Radiator"

Ask those who have used them.

THE BUSH MFG. CO., Hartford, Conn.



The New
Argo Electric
Roadster

Has Met with Instant Success

The Argo Roadster is a distinct departure from the old type of awkward, top-heavy electric. It has a long wheel base—low-hung construction—Interlocking foot control—non-reversible wheel steering apparatus—large artillery wheels—bevel gear drive and many other new improvements.

It has all the speed and all the mileage that you are ever likely to need—combined with the safety and convenience of an electric. Noiseless—clean—safe and economical to maintain.

Write For Our Catalog which gives complete description and specifications of the Argo Roadster, Brougham, etc.

Argo Electric Vehicle Co. Factories, Saginaw, Mich.
Metzger-Herrington Co., Distributors
2412-14 Michigan Ave. Chicago, Ill.

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Lauth-Juergens

Lauth-Juergens Trucks are Delivery Insurance

QUALITY DURABILITY

ONE, TWO AND THREE TON CAPACITY



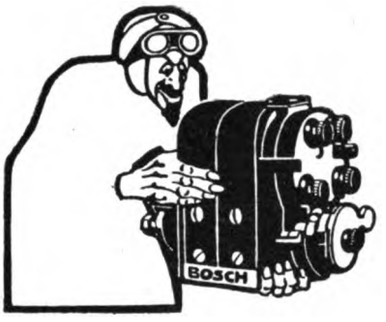
LAUTH-JUERGENS TRUCKS ARE THE LATEST IN CONSTRUCTION, most powerful in operation and the motors are guaranteed against defective workmanship and material for the life of the truck. They are positively the highest class trucks made. Two cylinder, one-ton, four cylinder, one, two and three-ton. Four speeds forward, Hess-Bright ball bearing transmission made in our own shops of the finest tool steel, three-piece disc clutch, covered by patents owned by us. Send for 1912 Catalog and specifications. Prompt delivery on all models. Large publicity campaign just begun. Our quality will do the rest.

Reliable Agents: Secure Your Territory for 1912 at Once.

The Lauth-Juergens Motor Car Co., Fremont, Ohio.

Branches and Agencies

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NEW YORK—West Side Garage & Motor Co., 160-162 101st St.
CHICAGO—The Lauth-Juergens Motor Car Co., 2630-32 Wabash Ave.
NEWARK, N. J.—Merchants Motor Car Co., Essex Building.
DETROIT, MICH.—Bierl Auto Truck Sales Agency, 453 Dix Ave.
DISTRICT OF COLUMBIA AND VICINITY—Bowles Motor Sales Co., Inc., 1608 14th St. N. W., Washington, D. C.



IN THE

French Grand Prix

1st.	Boillot	Peugeot	Bosch
2nd.	Wagner	Fiat	Bosch
3rd.	Regel	Sunbeam	Bosch

Of Course

The Bosch News for June is ready; write for it.

BOSCH MAGNETO COMPANY

223-225 West 46th Street New York

The Hotel of Comfort

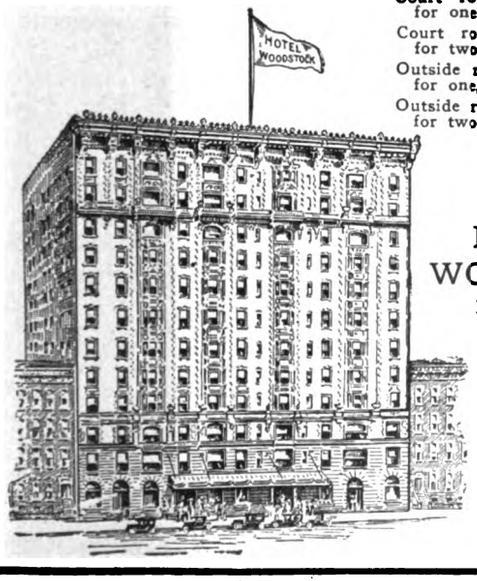
The WOODSTOCK

"You can walk from there to anywhere"

Our new addition is ready for occupancy.
We now have 360 rooms with 265 baths.
Write us for descriptive folder with typical floor plan and rate card.
Wire for reservation at our expense.

RATES

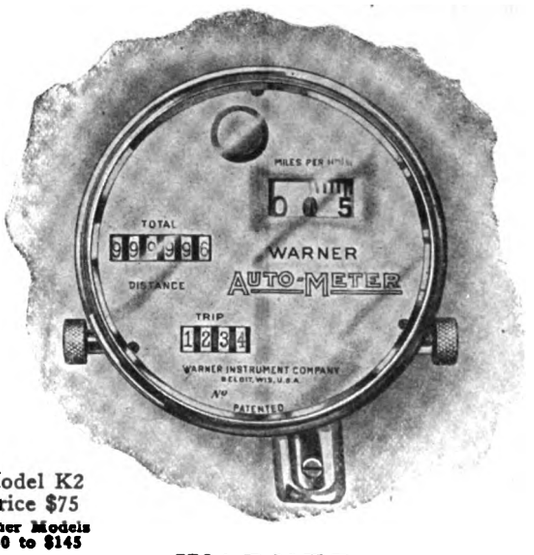
Court room with bath, for one, per day.....$2.50
Court room with bath, for two, per day..... 3.50
Outside room with bath for one, per day..... 3.00
Outside room with bath, for two, per day..... 4.00
Outside room with twin beds, for two, per day $4.00



HOTEL WOODSTOCK
127 W. 43d St.
New York

W. H. Valiquette, Manager.

Also
"THE BERWICK"
Rutland, Vermont



Model K2
Price $75
Other Models $50 to $145

WARNER

AUTO-METER

"The Aristocrat of Speed Indicators"

THOSE in other cars and who pass an Auto at the curb, say, "That must be a **good car.** See! It has a Warner on the dash!" The Warner is the Hall Mark of Quality on an Auto.

WARNER INSTRUMENT CO., 1197 Wheeler Ave., Beloit, Wis.

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$30.00 for a **$105.00** 6 cylinder
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You can repair **CASINGS** and **INNER TUBES** anywhere in 15 minutes, better than a Repair Shop can do—and for *one cent.*

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Absolutely automatic. Place the patch—attach the Vulcanizer—put in the gasoline-light it. No further attention required. In 15 minutes the job is done.

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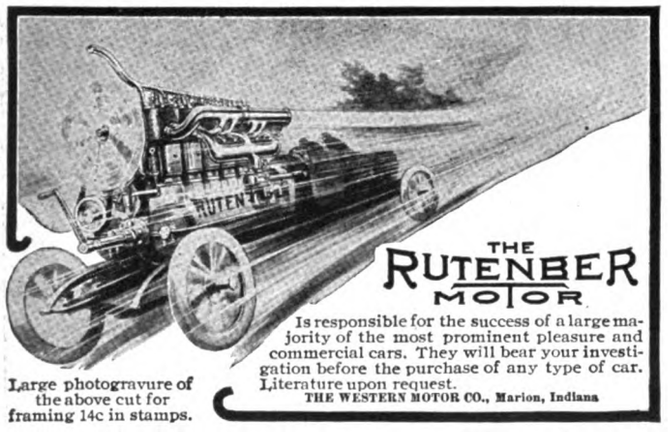
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will start any four-cycle engine of four or six cylinders. Turn on the switch—that's all.

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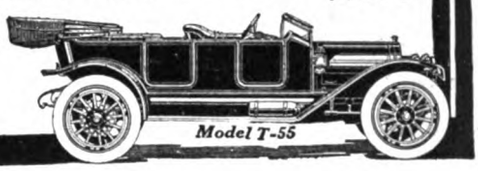


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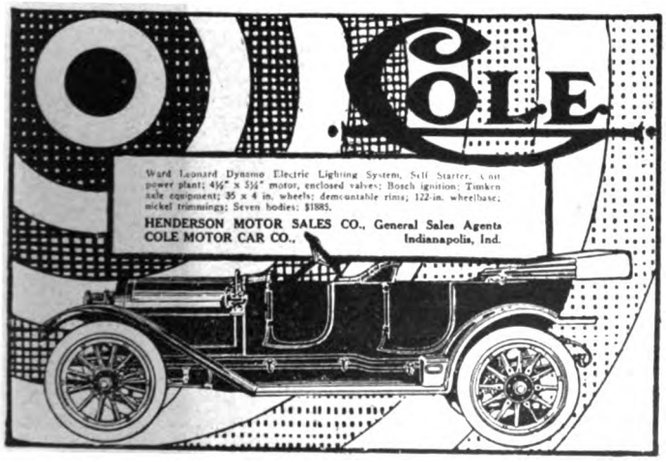
Clarke-Carter Automobile Company
Jackson, Mich.



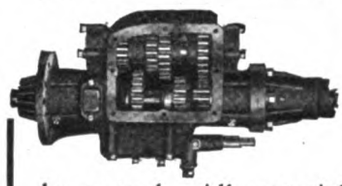
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Ward Leonard Dynamo Electric Lighting System, Self Starter, 4 cyl. power plant; 4½" x 5½" motor, enclosed valves; Bosch ignition; Timken axle equipment; 35 x 4 in. wheels; demountable rims; 122 in. wheelbase; nickel trimmings; Seven bodies; $1885.

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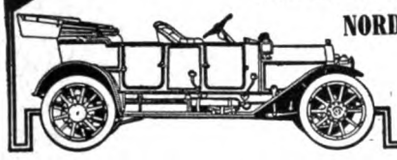
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Havers Self-Starting "Six-44"



Price $1850

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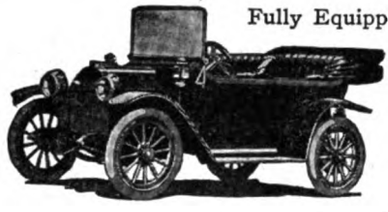
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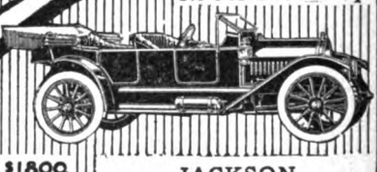
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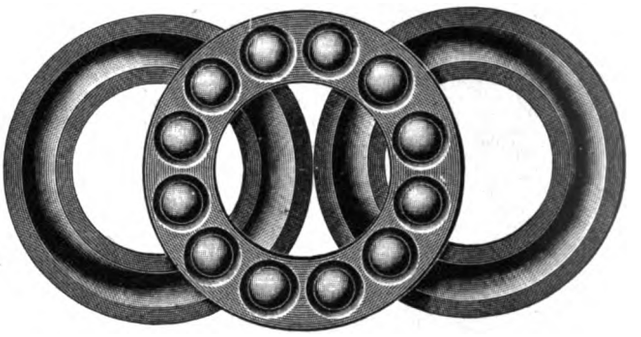
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Our Consulting Engineering Department is always at your service.

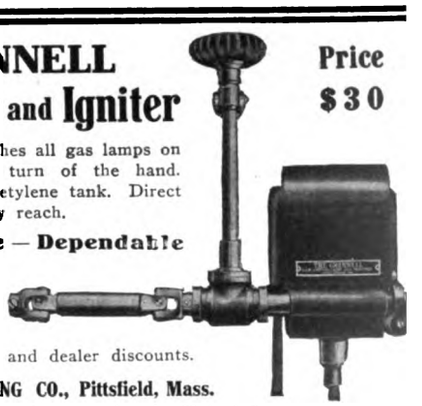
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The Crankless STARTER

By adding an injector and cylinder attachments the crankless starter becomes absolutely perfect—100% efficient. For 4 cylinders the extra attachment costs $10, for 6 cylinders, $15.

Guaranteed by our 40 years standing and reputation.

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KNIGHT-DAVIDSON
1896 — 1912

The CRESCENT valve of the K-D Motor, fitting around the stationary piston wall affords a larger port area than any other poppet or slide valve on the market. It is simpler and, consequently, better than any other valve construction known and is here offered to discriminating manufacturers, not as an experiment, but as a tried, tested and proved mechanical advance. The K-D motor is simple, silent, cools rapidly, has the simplest oiling system known, will not carbonize. Last and most important, will give on a given quantity of fuel more power, speed and endurance, unit for unit, than any other engine on any type of an automobile. We want to present some facts to interested manufacturers.

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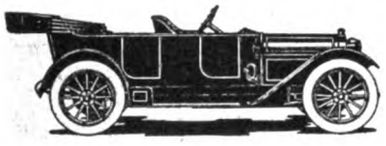
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Of proper design, more room, more luxuriously furnished, graceful constructive lines, unit power plant. Motor has overload capacity of more than 300%. Two-passenger Century Roadster; five-passenger Century Brougham. In finish, lines and equipment either is ahead of the highest price cars money can buy. Get our proposition NOW.

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40-Horsepower Touring Car or Roadster, absolutely silent in operation. Cylinders 4¼ x 5¼-in. — 116-in. wheelbase—34 x 4-in. tires—demountable rims—nickel mountings—massive, straight line body—big, roomy seats—proved self-starter—everything. Price $1500. Guaranteed for life by the Michigan Buggy Company. 40-horsepower Roadster on the same chassis. Two smaller models. Catalog on request. (83)

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Makes a Big Winner in Philadelphia
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Dear Sirs:—The axle is a great success, is running fine. Have made several demonstrations and every one says it's the only front axle that ought to be allowed to go on the automobile, for safety, easy steering and perfect control. Will sell the majority of those I have demonstrated for. Enclosed you will find order for one axle to go on a Studebaker car, 1908 model, more orders will follow later. We will equip at least one thousand cars this year. Our new garage will be at 1907 N. 23d St., after March 12th. Circulars received all O. K., thanks for same. Rush the order for axle, as every one on a car will sell several more.

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A SPRING starter of Simple Perfection, ABSOLUTELY AUTOMATIC action and FULLY GUARANTEED.

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should break their journey and avail themselves of the excellent facilities afforded by the D. & C. Lake Lines, operating daily service between Detroit and Buffalo and Detroit and Cleveland.

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The Little Aristocrat

This is the Big Brother of the Famous Empire Roadster and is a small edition of $5,000.00 cars.

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Seven Passenger, Fore-door Touring Car, fully equipped, less top, windshield and extra seats	$1800
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Its lightest—rightest—most economical—that's the reason we'll make seventy-five thousand of them this year. Prices $590 to $900. Agencies everywhere.
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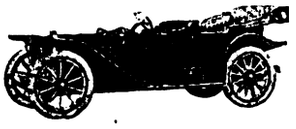
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At the close of the best year in the long history of this company, we want every Winton Six buyer to know that we appreciate his patronage and that, as the years go on, we hope always to be deserving of his continued patronage.

THE WINTON MOTOR CAR CO.
426 Berea Road Cleveland, O.

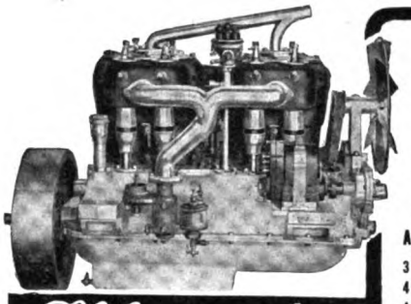
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Superior Features
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Perfect Workmanship
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The Consistent Motors

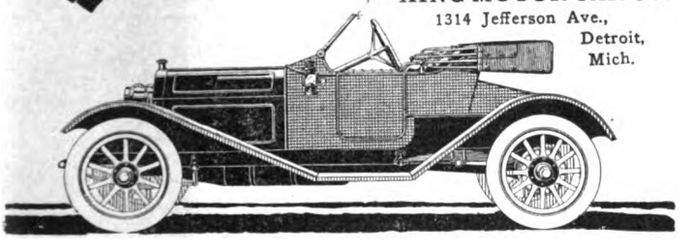
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Everybody is watching the new King Roadster, and wondering how we can offer such a car for the price. This is the time for the live dealer to write us.

With Full Equipment $1190

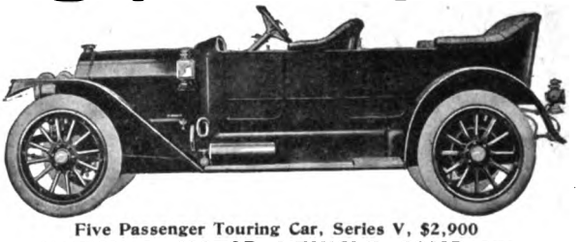
Terms, territory and detailed description on request.

KING MOTOR CAR CO.
1314 Jefferson Ave., Detroit, Mich.



Stock Champion **International Champion**

National 40



Five Passenger Touring Car, Series V, $2,900
NATIONAL MOTOR VEHICLE COMPANY
1007 E. 22nd Street Indianapolis, Ind.

They Barred the Franklin Out

The Quaker City Motor Club of Philadelphia conducted an economy run for motor cars April 27, open to all pleasure cars with the exception of air-cooled cars.

What They Did

In the Quaker City contest, open only to water-cooled cars, first prize for economy was awarded to a two-passenger car that averaged 22.7 miles per gallon of gasoline.

What the Franklin Has Done

46.1 miles on one gallon of gasoline in the economy contest conducted by the Automobile Club of Buffalo.

87 miles on two gallons of gasoline in the economy run held by the Automobile Club of America.

FRANKLIN AUTOMOBILE COMPANY, Syracuse, N. Y.

Hupmobile

Long-Stroke "32"
Touring Car
$900 F. O. B. Detroit

Motor 3¼ x 5½ inches; four cylinders; Bosch magneto; three speed sliding gears; tires 32 x 3½ inches; 106 inch wheelbase. Equipment includes windshield, gas headlights, generator, oil lamps, tools and tire repair kit.
Roadster body on same chassis and with same equipment, $900 F. O. B. Detroit.

Runabout—$750
F. O. B. Detroit. Same power plant as World-Touring Car. Wheelbase, 86 inches. Equipment of top, windshield, gas lamps and generator, oil lamps, horn and tools.

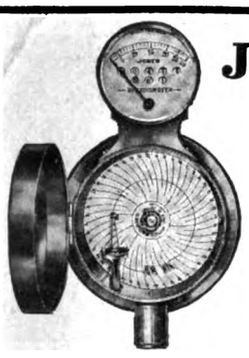
20 H. P. Models

Roadster—$850
F. O. B. Detroit. Same chassis and power plant as World-Touring Car. Wheelbase, 110 inches. Same equipment as Runabout, also highly finished steel box on rear deck for tools and accessories.

Coupe—$1100
F. O. B. Detroit. Same power plant as World-Touring Car. Wheelbase, 86 inches. Electric headlights, electric and oil side and tail lamps, folding dash seat for third person. Rear tires, 31 x 3½ inches. With 110 inch wheelbase, $1150.

HUPP MOTOR CAR CO., 1254 Milwaukee Ave., Detroit, Mich.

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JONES RECORDER

Gives time, speed and distance. Number of stops—length of each stop. Complete record of every movement or stop of vehicle marked on chart. Absolutely essential to all operators of motor trucks or delivery wagons.

The Jones Recorder consists of a strong brass casing, containing a clock work and flexible shaft from the drive wheel of the vehicle.

THE JONES RECORDER
Broadway and 76th Street **New York**

Any Kind Every Kind Stock, or to Blue Print

Rims

Clincher Q. D. Demountable Channels

For Automobiles, Motor Trucks, Aeroplanes, Motorcycles, Bicycles.

We Also Make Axles and Hubs.

MOTT WHEEL WORKS, Utica, N. Y.
R. B. ABBOTT SALES CO., Sales Agents, Detroit



"Firestone" Tires and Rims



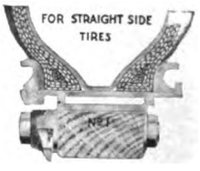
are the least likely to require changing, and afford the best means of tire changing when required.

The Firestone Tire & Rubber Co., Akron, Ohio
and All Principal Cities

Standard Universal Rims



fit any style or make of tires. The side rings are reversible, they curve outward on one side to fit a straight side tire, inward on the other to accommodate a clincher. Two turns of a nut unlocks the rim for demounting, two more turns locks the rim in place. Write for catalog 607, which explains fully.

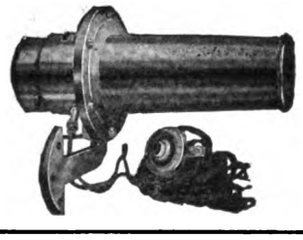


THE UNITED RIM COMPANY, Akron, Ohio

The Prestige accorded to

NEWTONE Motor Horns

is directly due to its efficiency in warning and economy in operation



Torpedo Type
Price $20

Automobile Supply Mfg. Co.
220 Taaffe Place, BROOKLYN, N. Y

GYREX
· THE MIXER ·



Saves 10% to 25% Gasolene
and Improves Your Engine

$3.00

GYREX fits intake pipe. Spins around at great speed and "mixes the mixture." Attached in five minutes. Send us $3.00 ($3.50 Foreign) and we will send it to you on trial. If not satisfactory your money is cheerfully refunded.

THE ROYAL EQUIPMENT COMPANY 436 Housatonic Ave. BRIDGEPORT, CONN.
Makers of DUPLEX and RAYMOND Brakes and RAYBESTOS Brake Lining

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Some automobile owners are always cleaning their spark plugs —others who use Reliance Plugs don't have to.

The Reliance book, "Ignition and Spark Plug Talk," tells why. Supposing you write today and get a copy.

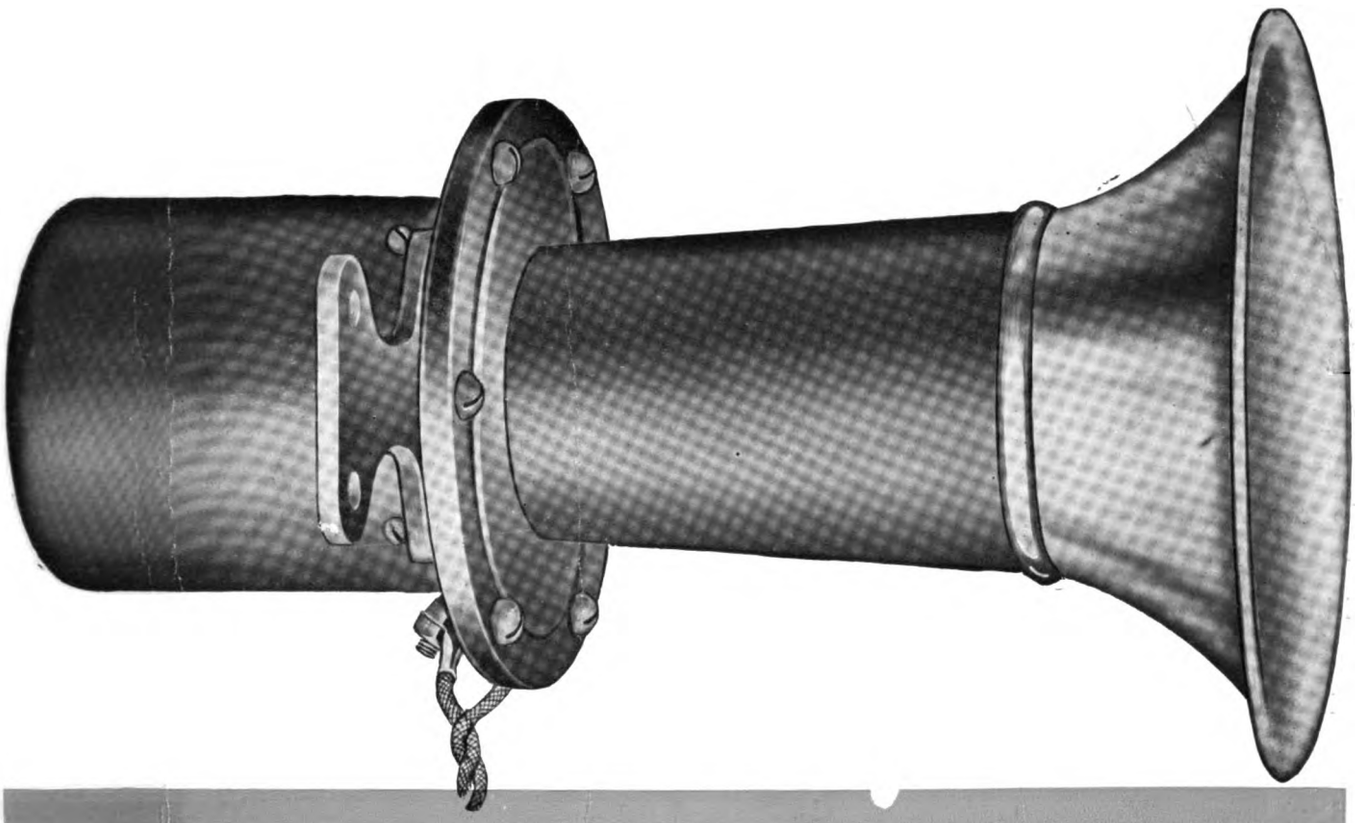
JEFFERY DEWITT CO.
65 Butler Avenue **Detroit, Mich.**
Largest Exclusive Spark Plug Manufacturers in the World

PRESSED STEEL

FRAMES

A. O. SMITH COMPANY
MILWAUKEE

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YOU CAN STILL WIN THAT $100

by naming this new signal

In thinking of your suggestions for a name take these facts into consideration:

The motor-driven signal has long been recognized as the logical—the most practical—the *ultimate* type. Its sole draw-back has heretofore been its *price*. Other types—the electric "buzzer," the exhaust, the bulb—have remained only because they could be made to sell for considerably less money than the Klaxon or Klaxonet.

No one denies that the Klaxon and Klaxonet are the best warning signals that it is possible to produce. No one has ever even *claimed* to make a signal as good. What they *have* talked is *price*.

No type or kind of signal on the market today can long withstand competition with this new—this MOTOR DRIVEN signal at *$12*.

Send in as many names as you wish—to reach us before July 15th—when selection is to be made. Mark envelope "Name Contest" and address it to the Lovell-McConnell Mfg. Co., 203 Wright St., Newark, N. J.

Deliveries will begin September 1st. No orders can be accepted prior to August 15th.



KLAXONET

Lovell-McConnell Mfg Company Newark, N.J., U.S.A.

KLAXON

"The Public Safety Signal"



KLAXON

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Studebaker

The $800 Studebaker-Flanders "20"

The Studebaker-Flanders "20" has a tremendous price advantage.

No other car, offering as much value approaches its price.

Think for a moment what you get when you buy a Studebaker "20."

It is a real car, modern throughout in design and construction, large enough, and so powerful that you will never find road conditions in which your Studebaker "20" cannot spin its wheels.

The motor is a marvel, very speedy, quick to pick up, flexible, the kind of a motor a driver grows to like and have full confidence in.

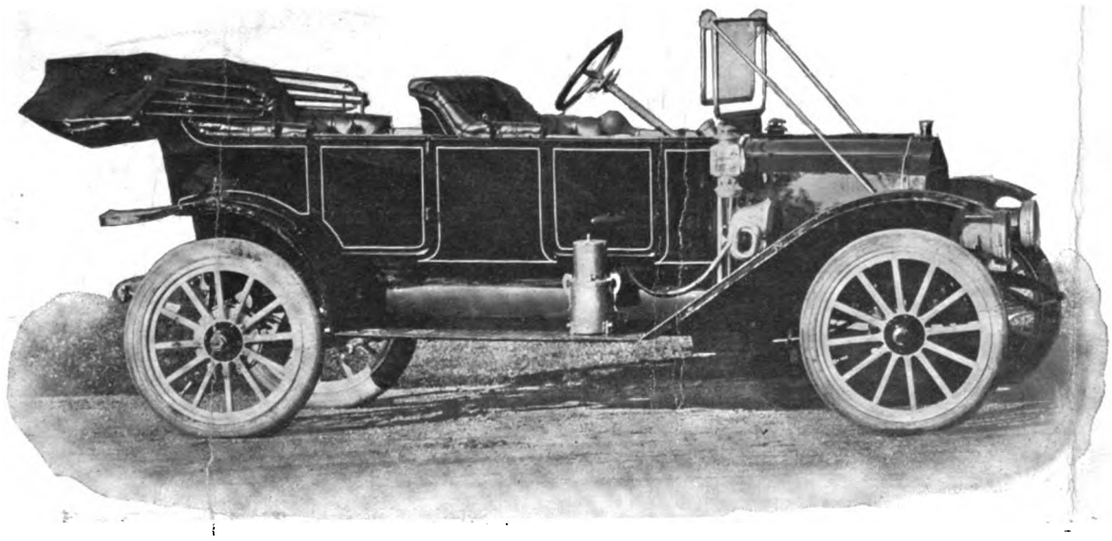
The Studebaker "20" transmission system is of the standard three speed type, any car speed you wish up to 55 miles an hour. The rear axle is remarkably well designed and built, giving the best of service.

Every Studebaker "20" body gets 17 coats of paint and varnish, which are properly rubbed and aged. If you take care of your car, your Studebaker body will equal any automobile body on the market.

These are some obvious points which show the car's value.

But the deeper you go into the design and manufacture of the Studebaker "20" the better you will like it. We watch every detail.

Every Studebaker "20" is built not only for the first mile but for the 20,000th mile. In those qualities which make for endurance and lasting satisfaction, the Studebaker "20" is incomparably first. Why? Because it is Studebaker-built, and Studebaker always builds that way.



Studebaker-Flanders "20" Touring Car, $800, f. o. b. Detroit.
Equipped, as above, with Top, Windshield, Prest-O-Lite Tank and Speedometer, $885.

ASK OUR DEALER FOR THE NEW STUDEBAKER
ART CATALOG OR SEND TO US FOR IT.

The Studebaker Corporation

Detroit, Michigan

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THE MOTOR WORLD

A Trade Paper Giving the World's Motor News

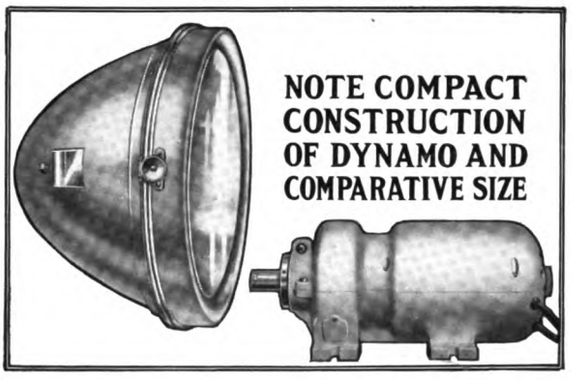
Vol. XXXII
No. 3

New York, July 11, 1912

Ten cents a copy
Two dollars a year

In a Class by Itself

GRAY & DAVIS
Lighting Dynamo System



This Lighting Dynamo possesses so many superior qualities that it actually has no competitor.

It is the only system with the necessary CONSTANT SPEED feature. It is the only system that lights lamps independent of the battery. It is the only system possessing the same characteristics as the dynamos which light your home.

Absolutely reliable. Guaranteed. Installed without difficulty. Satisfactory service or purchase price returned. No other system can compare with it. Standard equipment on America's leading automobiles. It should be on your car.

Write for Catalog

GRAY & DAVIS, Inc., 55 Lansdowne St., Boston, Mass.

MANUFACTURERS OF AUTOMOBILE LAMPS

Published Weekly by The Motor World Publishing Company, 1600 Broadway, New York

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On the Winning National

K 700 Drive

J 600E Drive

ADDRESS ALL COMMUNICATIONS TO THE COMPANY

CABLE ADDRESS "AUTOMOBILE" INDIANAPOLIS

NATIONAL MOTOR VEHICLE CO.

W.U.T. CODE. A.B.C CODE. (4TH EDITION)

Indianapolis, Ind, May 31, 1912.

Hartford Auto Parts Co.,

Hartford, Conn.

Gentlemen:

The Second Annual 500 mile International Sweepstake was won by DAWSON in a NATIONAL. This means more NATIONALS and more of your good material to build them.

We positively must have all the material due on our delivery specifications at once. We want June 1st material shipped June 1st. Ship it in at once so that the public can have all the NATIONAL CARS they are now demanding.

Please acknowledge this and tell us just what and when.

Yours truly,

NATIONAL MOTOR VEHICLE CO.

Thos. J. Moore

This advertisement is just a final echo from the Indianapolis Speedway. The fact that Joe Dawson's winning National was Hartford equipped is incidental—and only natural, because National cars are "quality" clear through.

The one big fact that stands out—one that we want every car manufacturer to know—is just this—

The National people kept hard after us for prompt deliveries—and we made good.

J. S. BRETZ CO., New York, Detroit, Sole Selling Agents.

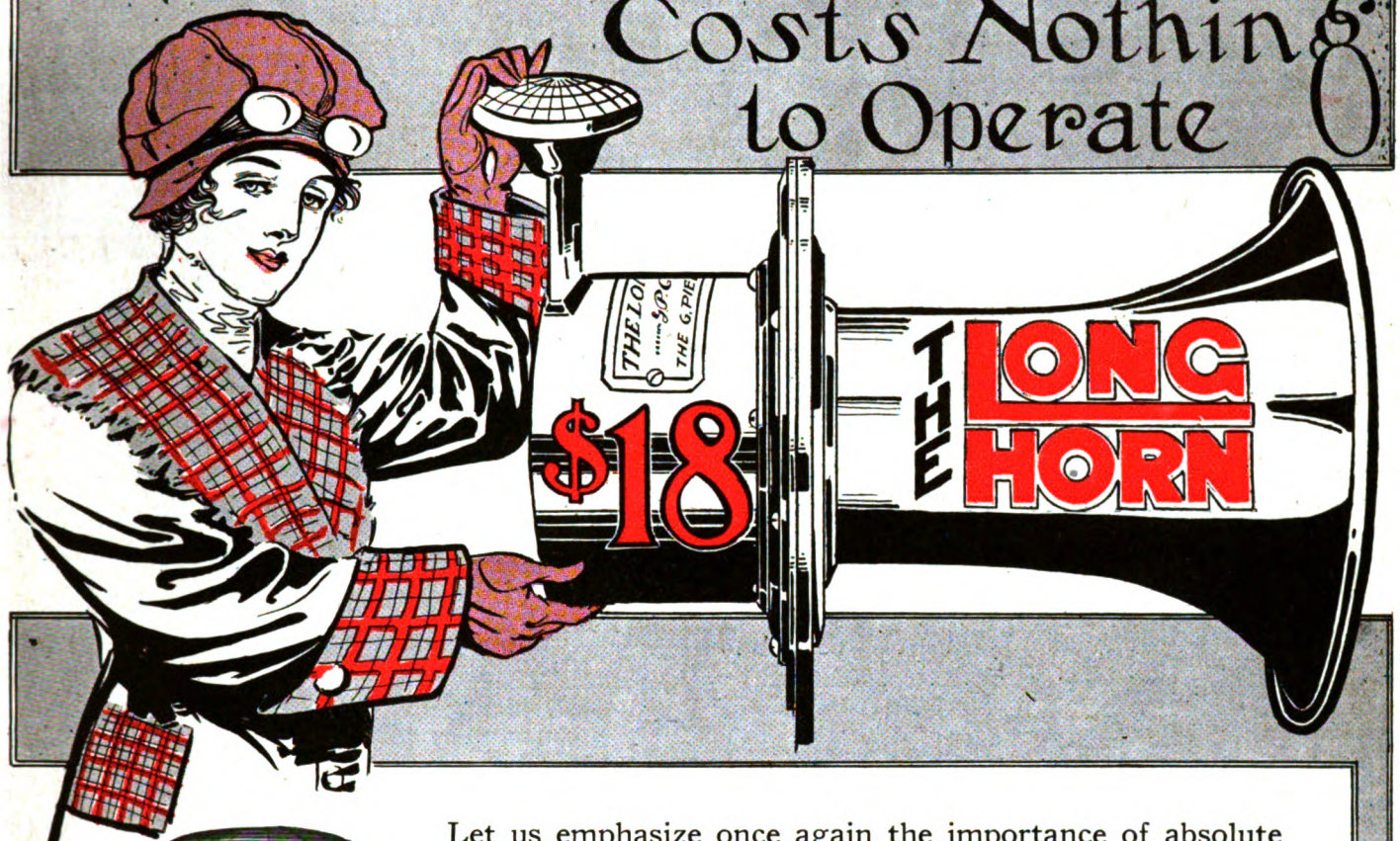
CONE CLUTCHES

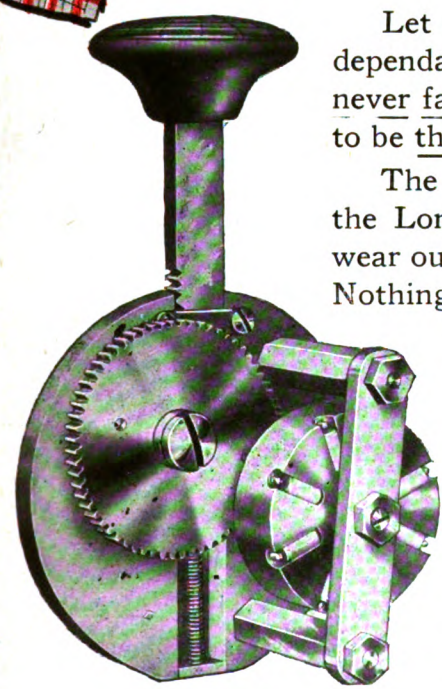
HARTFORD AUTO PARTS CO.
HARTFORD, CONN.

UNIVERSAL JOINTS

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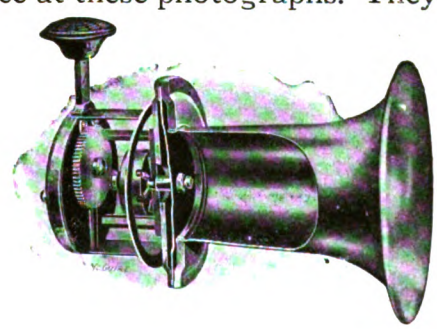
Costs Nothing to Operate





Let us emphasize once again the importance of absolute dependability in a warning signal. The perfect signal must never fail—not once in its entire life time. That once is sure to be the once that the warning was most needed.

The Long Horn can never fail. There is nothing about the Long Horn that could permit failure. No batteries to wear out. No motor to break down. No bulb to rot or crack. Nothing but a simple, positive, mechanically operated signal that must always issue its warning note if you but press the button. Glance at these photographs. They tell the story in themselves. Then write us for territory. Dealers will find that the Long Horn makes them both friends and money.



THE G. PIEL COMPANY

13th Street and Boulevard
LONG ISLAND CITY

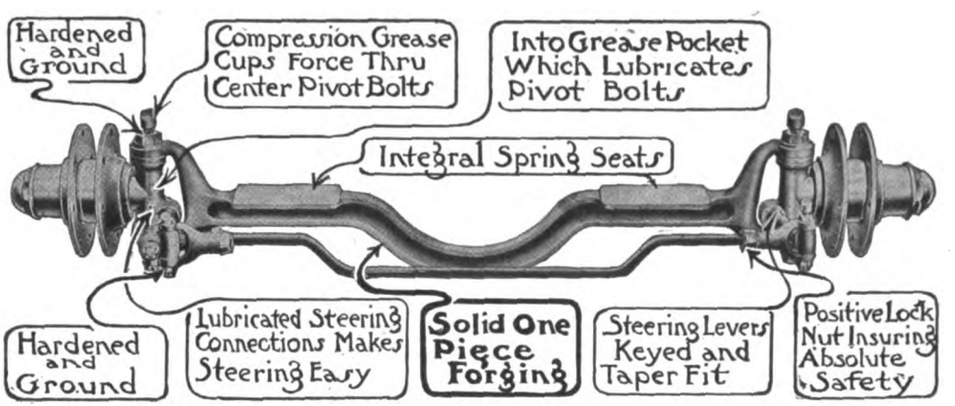
PHILADELPHIA, PA., 1416 Vine Street
BOSTON, MASS., 109 Massachusetts Avenue
MINNEAPOLIS, MINN., 70 So. 10th Street
BUFFALO, N. Y., 852 Main Street
SAN FRANCISCO, CAL., 544 Van Ness Avenue
LOS ANGELES, CAL., 1229 So. Olive Street
SEATTLE, WASH., 917 E. Pike Street
PORTLAND, ORE., 329 Ankeny Street
DENVER, COL., 15th and Curtis Streets

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EXPERIENCE — SHELDON — RIGHT DESIGN
FACILITIES — AXLES — RIGHT STEEL

"Made in the Largest Axle Factory in the World"

Axle Talk—No. X



SHELDON quantity production does not presuppose automatic production which always allows the occasional faulty axle to get through the shops and on to the car.

SHELDON demand is growing, hence we must have quantity production—but we meet this increased demand with increased help in the inspection as well as in the mechanical force.

Every SHELDON axle must have its diploma before it is sent out to do the work for which it is designed and made. Before receiving this diploma its examination is severe.

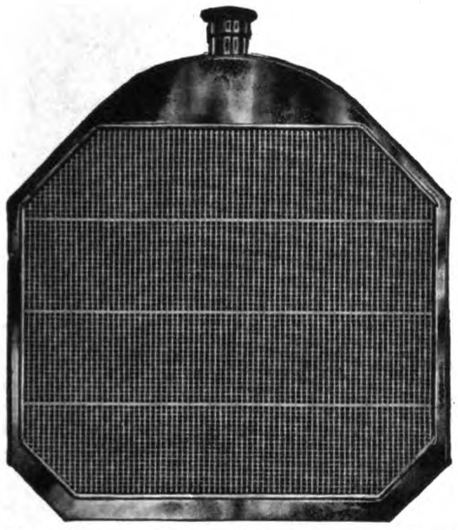
Particular attention is paid to tests which must prove each axle capable of standing up against road shock, in its different phases, side thrust and a dozen and one causes which call for sturdy and continued resistance.

"Inspection of the individual axle by the individual" is the key note in SHELDON quality and our guarantee practically extends from the factory to the manufacturer and then to the consumer.

SHELDON AXLE COMPANY, Wilkes-Barre, Pa.

CHICAGO OFFICE—68 East 12th St. DETROIT OFFICE—1215 Woodward Ave.

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The Mayo—the radiator thoroughbred

¶ Mayo—the radiator with a nation wide reputation for highest efficiency.

¶ Combined constructive details that make for positive operation—all the trouble features left out.

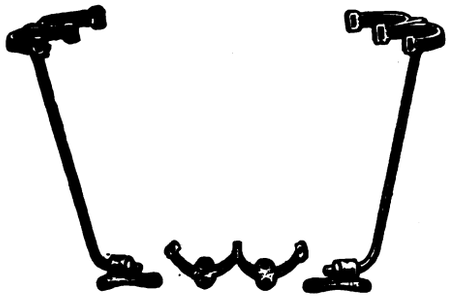
¶ To specify the Mayo Radiator is to specify the best that modern facilities can produce.

Mayo Radiator Company
NEW HAVEN, CONNECTICUT

The Largest Automobile Supply House in America

FIFTEEN STORES IN THE UNITED STATES

"Torpedo" Tire and Demountable Rim Holders



Designed especially for use on Torpedo body or Fore-door cars. Set consists of two strong arms, firmly bolted to running board and permitting of sufficient adjustment to accommodate two tires or demountable rims, of standard sizes, 4 inch or smaller. Made of solid Brass and guaranteed to give perfect satisfaction.

Finish: Furnished in Hard Rubber Black Enamel finish, and full Polished Brass.

	Brass	Black
Price, complete with Straps...	$4.00	$3.00

A dozen other styles and sizes in stock. See catalog.

Our 1912 Catalog, which is held as a book of reference by manufacturers, dealers and automobile owners, will be mailed on request. Circulation limited to 100,000 copies.

Chas. E. Miller

MANUFACTURER, JOBBER, EXPORTER AND IMPORTER

HOME OFFICE

97-99-101-103 Reade St., New York City

ORDER FROM NEAREST BRANCH, ADDRESS CHAS. E. MILLER

NEW YORK CITY—97-103 Reade St.
NEW YORK CITY—924 Eighth Ave.
NEW YORK CITY—2782 Broadway.
BUFFALO, N. Y.—824 Main St.
BROOKLYN, N. Y.—1421 Bedford Ave.
ALBANY, N. Y.—135 Central Ave.
BOSTON, MASS.—202-204 Columbus Ave.
HARTFORD, CONN.—274 Trumbull St.
DETROIT, MICH.—227-229 Jefferson Ave.
CLEVELAND, OHIO—1829 Euclid Ave.
PHILADELPHIA, PA.—318 North Broad St.
ATLANTA, GA.—66 Edgewood Ave.
NEW ORLEANS, LA.—601-603 Barrone St.
NEWARK, N. J.—374 Halsey St.
SPRINGFIELD, MASS.—Bridge and Dwight Sts.

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Are They Getting Back of the Cobwebs



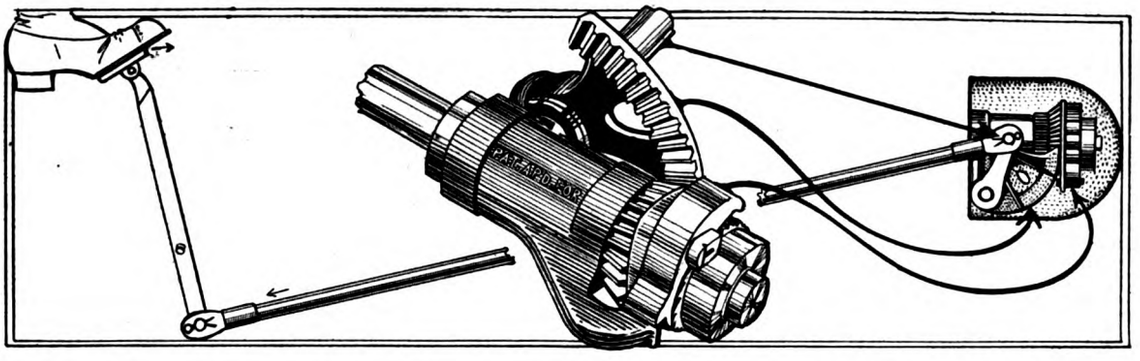
Looks pretty much like it.

And it's just one of our predictions being fulfilled—possibly a little earlier than we anticipated.

Self starters that are going into the discard have inefficiency, over-production and price cutting to blame. **And inefficiency principally.**

The National Starter was born out of the cumulative mistakes of designers in valves, tubes, wires, tanks, dynamos and the other ninety odd per cent "make good" devices.

And as the lower illustration shows, it is a strong, sturdy, **common sense** application of a primal **mechanical** principle.



That's why it must start the car every time you push the foot pedal.

There isn't much more to say—but here are two facts big with meaning:

The only unbreakable, dependable self starter must be purely mechanical.

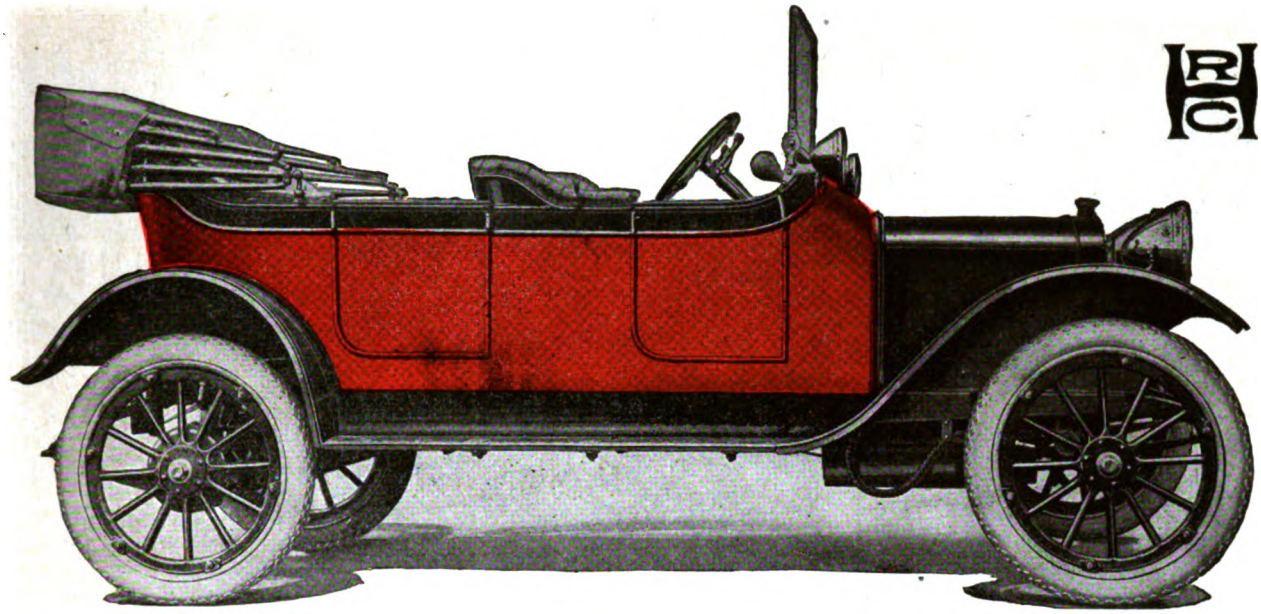
The only perfected, tried and proven mechanical self-starter is the National Starter, illustrated here.

The price of the National Starter is $50.00 and it will give ten times more service and satisfaction to its user than any tangle of complications that ever coughed engine disorder into a cylinder. **More dealers wanted.**

NATIONAL GAS ENGINE STARTER COMPANY

30-32 North Dearborn Street **Chicago, Ill.**

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R-C-H "Twenty-Five" $900

f. o. b. Detro

The Car

WHEELBASE— 110 inches.

MOTOR—Long-stroke; 4 cylinders cast en bloc; 3¼ inch bore, 5-inch stroke. Two-bearing crank shaft. Timing gears and valves enclosed. Three-point suspension.

DRIVE— Left Side. Irreversible worm gear, 16-inch steering wheel. Spark and throttle control on steering column.

CONTROL— Center Lever operated through H-plate integral with universal joint housing just below. Hand-lever emergency brake at driver's right. Clutch pedal operated by left foot. Service brake operated by right foot. Foot accelerator in connection with hand throttle.

SPRINGS— Front, semi-elliptic; rear, full elliptic and mounted on swivel seats.

FRAME— Pressed steel channel.

AXLES— Front, I-beam, drop-forged; rear, semi-floating type.

TRANSMISSION— Three speeds forward and reverse; sliding gear, selective type.

CONSTRUCTION— Drop-forgings wherever practicable; chrome nickel steel used throughout all shafts and gears in the transmission and rear axle; high carbon manganese steel in all parts requiring special stiffness.

BODY— Full 5-passenger English type; extra wide seats; 10-inch seat cushions specially upholstered.

WHEELS— Artillery type.

The Equipment

Non-skid tires—32 x 3½.
12-inch Bullet electric head light with double parabolic lens.
6-inch Bullet electric side lights with parabolic lens.
Bosch Magneto.
Warner Auto-Meter.
Demountable rims.
Extra rim and holders.
Tally-ho horn.
Jiffy curtains—up or down instantaneously.
Top and top cover.
Windshield.
Rear view mirror.
Tool-kit, Jack, Tire Repair Kit, Pump.
Robe Rail.

How About It Mr. Dealer?

It's a good deal more profitable to make sa than to make apologies.

If half your time with a prospect has to be p in explaining why your car lacks certain featu that another car offers, there'll be a whole lot people that explanations won't satisfy.

The R-C-H dealer doesn't have to waste time apologies or explanations. For the car itself sat fies every need of the average motorist; and possesses the most complete list of high gra equipment ever placed on a car at a popular pri

The R-C-H this season will be the standard which other popular-priced cars are judged.

This fact is universally recognized—if yo read the specifications and equipment details the left, you'll admit it yourself.

So hadn't you better write, wire or call at or on our nearest branch?

R-C-H CORPORATION, 104 Lycaste Street, Detroit, Michiga

Branches — ATLANTA, 548 Peachtree St.; BOSTON, 563 Boylston St.; BUFFALO, 1225 Main St.; CHICAGO, 2021 Michigan Ave.; CLEVELAND, Euclid Ave.; DENVER, 1520 Broadway; DETROIT, Jefferson Ave. and Lycaste St.; KANSAS CITY, 3501 Main St.; LOS ANGELES, South Flower St.; MINNEAPOLIS, 1206 Hennepin Ave.; NEW YORK, 1989 Broadway; PHILADELPHIA, 330 North Broad St.; FRANCISCO, 819-835 Ellis Ave.; WALKERVILLE, ONT., CANADA.

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One reason for Reliance quality

THIS picture illustrates one step in the manufacture of a Reliance Magneto Spark Plug. A skilled potter is working at a lathe with forming tool and calipers, turning the half-hard clay to microscopically exact proportions before it is sent to the ovens to be baked into our heat-defying porcelain. This skilled laborer and his fellow workers draw big pay and are worth it. They are one of the reasons why Reliance Spark Plugs are the best your money can buy.

Supreme in Oily Engines **Reliance MAGNETO PLUG**

The secret of the Magneto Plug's efficiency lies in two things—the high quality of the porcelain and the alloy of platinum and iridium we use for making the central electrode that carries the current. We make this porcelain in our own potteries, importing our clays and other ingredients from abroad; and we pay for our platinum and iridium a price higher than that of pure gold.

This central electrode is a **solid** piece of platinum-iridium. In ordinary practice a mere tip of platinum alone is used. Our electrode is baked in the porcelain by a secret process, which does away with cements, nuts, gaskets and the like, and absolutely prevents compression leakage.

Perfection in every detail has been our aim. A closed end has also been developed, which both gives greater stability to the entire plug and **makes it especially desirable where an excess of oil is used.** The price of the plug is $1.25.

Will you try a set at our risk? We will mail them prepaid on receipt of price and give you an ironclad guarantee of satisfaction or your money back any time you say. When writing, specify size wanted or make of car.

Our book, "Ignition and Spark Plug Talk"—every motorist ought to have a copy —mailed free for the asking. Write for it.



Magneto Type, $1.25

Jeffery-Dewitt Company 65 Butler Avenue DETROIT, MICH.

New York Office, 1789 Broadway

LARGEST MANUFACTURERS OF SPARK PLUGS IN THE WORLD

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SPLITTING Hairs at the Timken Plant

It is literally necessary to split hairs to illustrate the extreme accuracy of the manufacture of Timken Roller Bearings.

An accuracy and care that came after Timken Bearings had won their way on the sheer merits of their unique principles of design alone.

TIMKEN
TAPERED ROLLER BEARINGS
are made with as much care as a watch

Take the gauging of the rollers for instance. Every roller in a Timken Bearing must be just the size of every other roller.

It would never do to trust the gauging of the rollers to human hands. Human liability to err is too great. The mechanical perfection of Timken Bearings is a matter of too much pride with us.

So we designed and built machines that take the rollers after they have been hardened and ground to the limit of human accuracy and sort them into lots in which every roller is the exact size of every other roller.

The machines do not err—they do not depend on human eyesight or judgment.

They distribute the rollers with unerring accuracy to different containers. The separation of the sizes is purely mechanical, and electrical. Electric contact decides which container each roller shall enter.

When the gauging is finished each container holds rollers of the same identical size. The containers are sealed till the workman assembles his bearings. Then he knows positively that every roller is right.

This is just one example of the care in making that assures you not only the bearing with all the correct principles of design, but the bearing that is built with the utmost accuracy.

This is one of the reasons why Timken Roller Bearings are giving such satisfactory service in the cars of the great majority of American pleasure and commercial car builders.

The list of Timken Users names nearly every good car that you know. Printed in a booklet called "The Companies Timken Keeps." Send for a copy today.

The Timken Roller Bearing Company
Canton, Ohio, U.S.A.

The only axle manufacturer licensed to make automobile axles equipped with Timken Roller Bearings is the Timken-Detroit Axle Company

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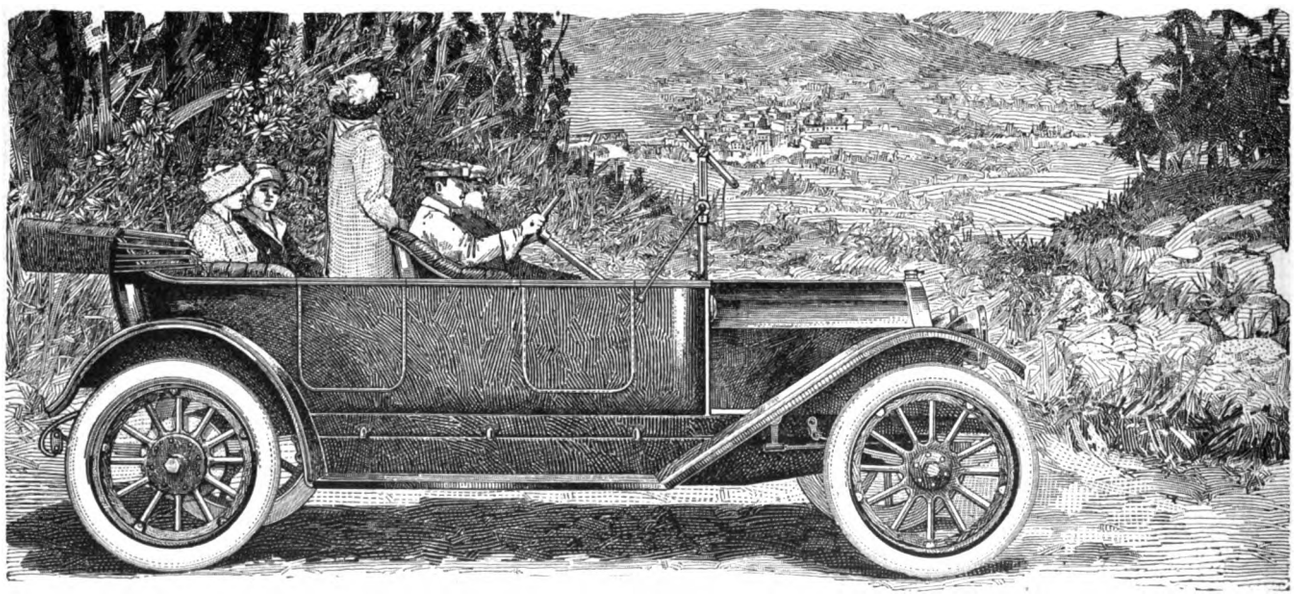
SILENT Great Western FORTY 1913

Another Bullseye for 1913

Great Western Hits Highest Mark of Value

Last year we swung into the line of big sellers by a vigorous announcement of the advance 1912 features we had put into our car. This year we break all records by not only including a host of new up to the minute improvements, but also offer the 1913 Great Western, fully equipped **at $1,585 or $265 less than the previous model.**

With our increased output, cutting down factory expense, we are offering you a car at $1,585 which for beauty, power, speed, quiet operation, reliability, completeness and general all around satisfaction, compares with any $2,500 to $3,000 car in the world. It is not our policy to make only a few cars and charge you a big price for our name. Rather than that, we aspire to place dozens of Great Westerns in every community in the United States—owned by people who want the right kind of service and convenience out of their cars—but who are not averse to saving a thousand dollars or more at the outset.



The 1913 Great Western Touring Car

The 1913 line includes a Roadster, Four Passenger Touring Car, Five Passenger Touring Car and a Four Passenger Sedan for winter use.

Great Western Automobile

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1913 **Great Western** FORTY **$1585**

18 Years of Progress Back of This

Luxury, Power **Sturdy Guaranteed Car** *Absolute Silence*

This year's Great Western is an amazing value, including all these great new features:

Presto Self-Starter—Electric Lights—Quiet Running Motor

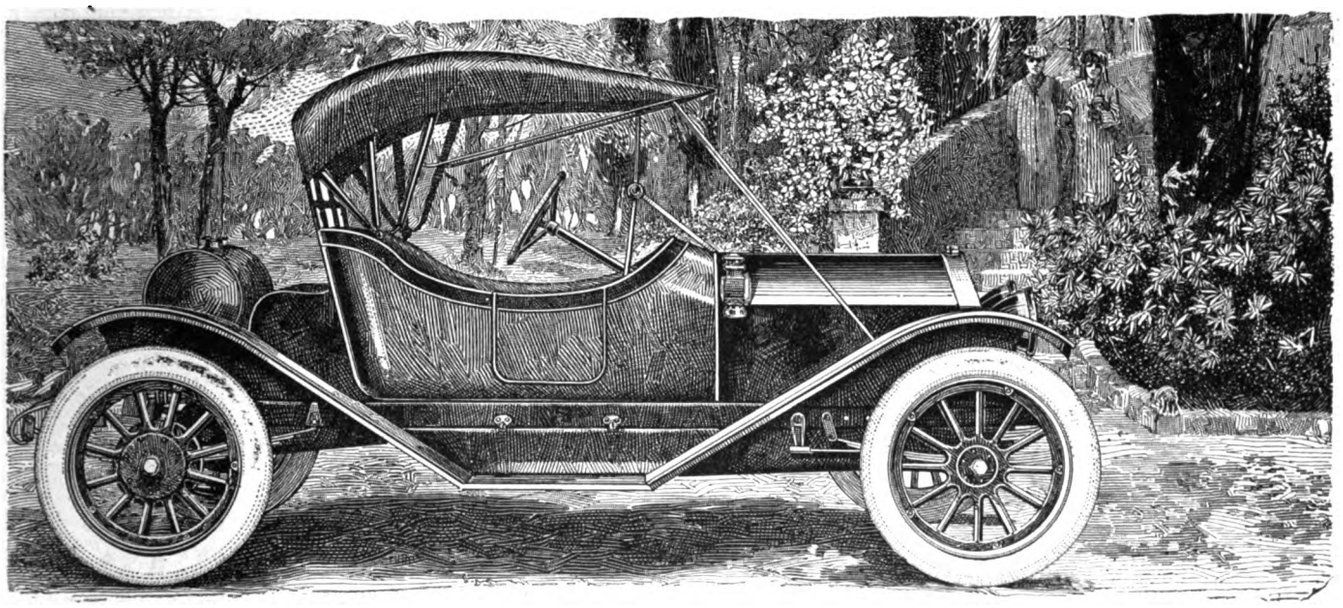
Nickel and black trimmings throughout
Stewart & Clark Speedometer
Solar electric lights
Silky mohair top
Fairfield rubber dust hood
Rain vision ventilating wind shield
36 x 4 inch tires
Demountable rims
Typhoon electric signal
Foot and robe rails
Tool box and tools

L head 4¼ x 5½ long stroke motor
Full 40 Horse Power
Accessible unit power plant
Enclosed valves all on one side
118 inch wheel base
Tire irons and extra rim
Gasoline tank gauge
Deep upholstering, hand-buffed leather
Invisible coil with lock switch
Jack, pump and tire repair kit

Full floating rear axle with large New Departure and Hyatt bearings
Large powerful double internal expanding brakes
Tie rod behind front axle
Cellular front radiator
Latest Remy magneto with kick switch
Easy riding Vanadium steel springs
Handsome body, deep blue color, black walnut trimmings, 18 processes of body finish

Nearly everybody has heard of the Great Western's wonderful record as official pathfinder, prize hill climber, and official selection by the U. S. Government for Indian service in the West. These facts are absolute proofs of quality. Send for new 1913 catalog telling in detail all about this handsome, trustworthy car. A complimentary subscription to *The Tattler*, our interesting little monthly magazine, also on request.

Dealers: **There's a great big sales activity stirring everywhere for the Great Western. It has the quality that attracts attention and makes people decide to buy. Our 1913 organization is being extended to cover every live town in the United States. We can take on a few more hustling dealers who want to handle a fast selling car. Write today.**



The 1913 Great Western Roadster

The 1913 line includes a Roadster, Four Passenger Touring Car, Five Passenger Touring Car and a Four Passenger Sedan for Winter use.

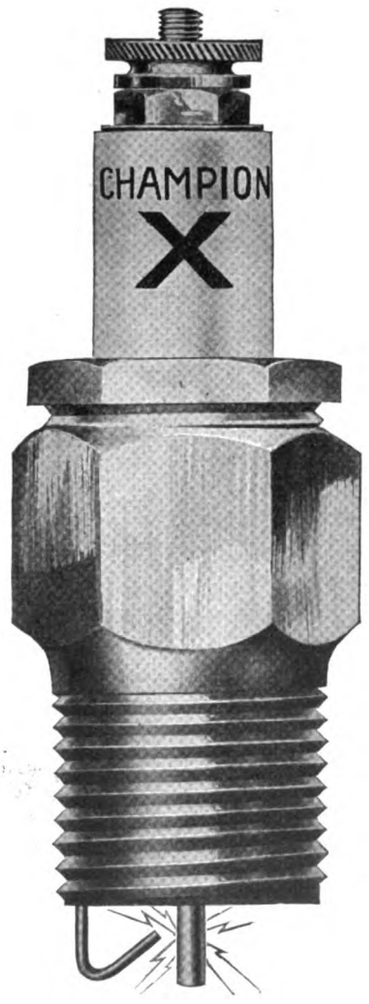
Company, Dept. 37, Peru, Indiana

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CHAMPION

TRADE-MARK

Champion Spark Plugs



CHAMPION X
75 Cents

Champion spark plugs are built by machinery found in no other plant. We assemble each plug in a way that permits no leakage. This is the secret of Champion superiority.

Out of every 100 cars made in 1912, 60 are Champion equipped. Our production for 1913 will be greater than ever. It is the result of Champion maximum satisfaction.

Twenty-five per cent of the manufacturers of the United States specify Champions. This means Champions have stood the test of road and laboratory. The two largest producers, Ford and Overland, call for Champions. Such demands have made our factory the largest in the industry.

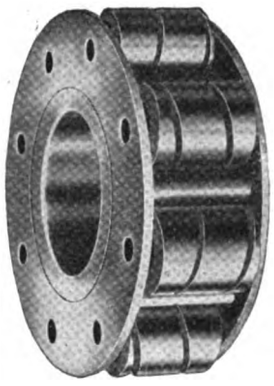
You always buy up-to-date Champions. Dealers who find a preference for one style are urged to exchange others. They come in a box bearing the "World" trade mark.

Manufacturers and agents, write today.

Champion Spark Plug Co.

Dept C **TOLEDO, OHIO**

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Axle Design

SEVEN COSTLY CARS from factories of seven different well known car builders were exhibited at recent shows with semi-floating axles. These cars were priced at from $2,000 to $6,000, with five of them over the $5,000 mark. If this type of axle were good only for the cheaper cars would the above facts be possible?

THE ESSENTIAL DIFFERENCE between a "semi" and any other form of floating axle is that the bearing at the wheel hub is inside the axle tubing instead of outside. No matter what the construction, the parts which carry the weight of the car and transmit the power are made sufficiently strong to do their work. This is what interests the user.

WITHDRAWABLE AXLE SHAFTS can be made a feature of a semi-floating design as well as of any. Other features also are interchangeable. And always it must be remembered that a real full-floating job requires two bearings in each wheel—or twice the number of bearings to increase production costs.

AN INCREASING DEMAND finds many cars now equipped with the "single bearing" type of floating axle. Properly this is called "three-quarter floating." It supplies at once an economical and high class construction. One bearing is used in each wheel and the bearing is placed outside the axle tubing.

DOES YOUR SALESMAN EXPLAIN who makes the axles, their details of design and why they are strong enough to stand the strain? Does he describe the bearings, telling why they are best for the purpose, and that behind them stands a firm's admitted reputation for fair dealing? Or does he simply point to the axle and try to dismiss the whole subject with the one term "full-floating"?

THERE WAS A TIME when any popular catchword would sell a car. Conditions have changed 'til now the purchaser is as wise as the salesman. He knows there are bearing makers who have grown up with the business and who have been successful for three reasons: First, their product is theoretically right; second, it is made right, and third, its users are treated right.

REGARDLESS OF DESIGN in its relation to axle types, he knows that Hyatt Flexible Roller Bearings in an axle spell complete satisfaction to him as an owner.

HYATT ROLLER BEARING CO.
DETROIT, MICHIGAN

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Marion

Expansion Follows Satisfaction

TEN YEARS of making good at a fair price forces the expansion of the Marion Motor Car Company. We built our first cars well. We built better cars each succeeding year. Now we have plans for the greatest Marion of all. Marion age, Marion quality and Marion reputation have combined to make urgent an increased production. We recently announced our plans. They are nearing cimpletion Numerous men of national prominence as producers are now with us. Factory facilities are broadened. We are ready to make the greatest Marion of all.

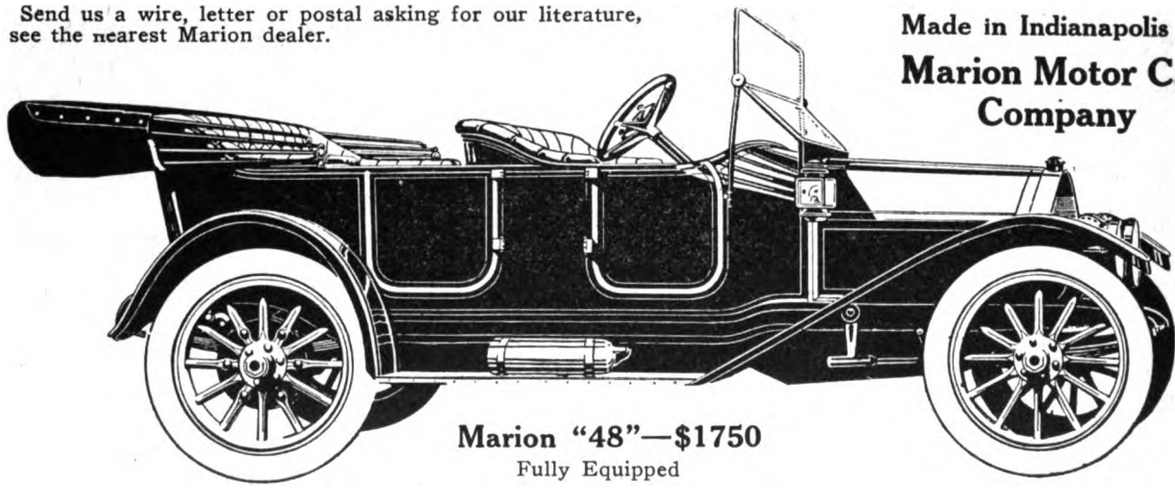
To buy because of low price is unwise. To pay more than necessary is to yield to pride. The Marion is the medium. It is a good car at a fair price. It performs constantly and economically year after year. It doesn't have to be "traded in."

Ten year old Marions are doing valiant duty today. This year's models all have the Marion sturdiness and efficiency of old, but they also have every refinement and improvement automobile engineers have produced since.

In other words, the MARION is a good car, a time-proven car, a modern car. It is sold at a price that suits the man or woman who demands a genuinely good and serviceable automobile in exchange for the exact amount of cash it is worth.

Send us a wire, letter or postal asking for our literature, or see the nearest Marion dealer.

Made in Indianapolis by
Marion Motor Car Company



Marion "48"—$1750
Fully Equipped

Five-passenger, fore-door touring; forty-five horsepower; motor, 4⅛ x 5½; wheel base, 120 inches; tires, 36 x 4 quick detachable; nickel trimmings throughout. $1750 includes equipment as follows: **Fine mohair top and curtains; fine mohair and rubber top boot; Zigzag plate glass wind shield; $50 Warner speedometer; Prest-O-Lite self-starter; Prest-O-Lite tank; full set five (5) lamps; full set tools, repair kit, etc.**

Model "Thirty-Seven," $1350
Fully Equipped

Five-passenger, fore-door Touring; Forty horsepower; motor, 4 x 5; wheel base, 112 in.; tires, 34 x 4, quick detachable. $1350 includes equipment as follows:

Fine mohair top and curtains; fine mohair and rubber top boot; $50 Warner speedometer; genuine plate glass wind shield; Prest-O-Lite self-starter; Prest-O-Lite tank; full set five (5) lamps; full set tools, repair kit, etc.

"Bobcat" Roadster (Model Thirty-Six) $1350
Fully Equipped

Two-passenger Roadster; forty horsepower; motor, 4 x 5; wheel base, 112 in.; tires, 34 x 4, quick detachable. $1350 includes equipment as follows:

Fine mohair top and curtains; fine mohair top boot; rubber driving apron rolled on dash; $50 Warner speedometer; Prest-O-Lite self-starter; Prest-O-Lite tank; full set five (5) lamps; full set tools, repair kit, etc.

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Inspecting Fabric for Firestone Tires



"Firestone"

RIGID inspection of the matchless material used by the world's most skilled tire builders—that's the secret of Firestone unchallenged leadership.

An idea of how thorough this inspection is, how high grade the material used, may be had from the illustrations. Fabric is the backbone of every worth-while tire. Fabric alone in

Firestone

Smooth Tread and Non-Skid Tires

would place them in a class apart. The finest combed Sea Island cotton is used. Yet even of this sturdiest of materials many carloads are thrown out because they cannot pass the test. Before fabric is worthy of Firestone use, *it must show a resisting strength several times greater than any possible road strain.* Every roll is tested again and again and every yard inspected, inch by inch. Imperfections cannot creep in; Firestone Tires cannot "let down."

This unprecedented care is followed through every detail of manufacture. It costs more to build Firestone Tires, but their extra mileage *built in* under titanic tests and infinite inspection, assure to all users

Most Miles Per Dollar

Service-Wise Users Specify, and Trade-Wise Dealers Recommend—
FIRESTONE EQUIPMENT.

The Firestone Tire & Rubber Company
"America's Largest Exclusive Tire and Rim Makers."
Akron, Ohio
All Principal Cities



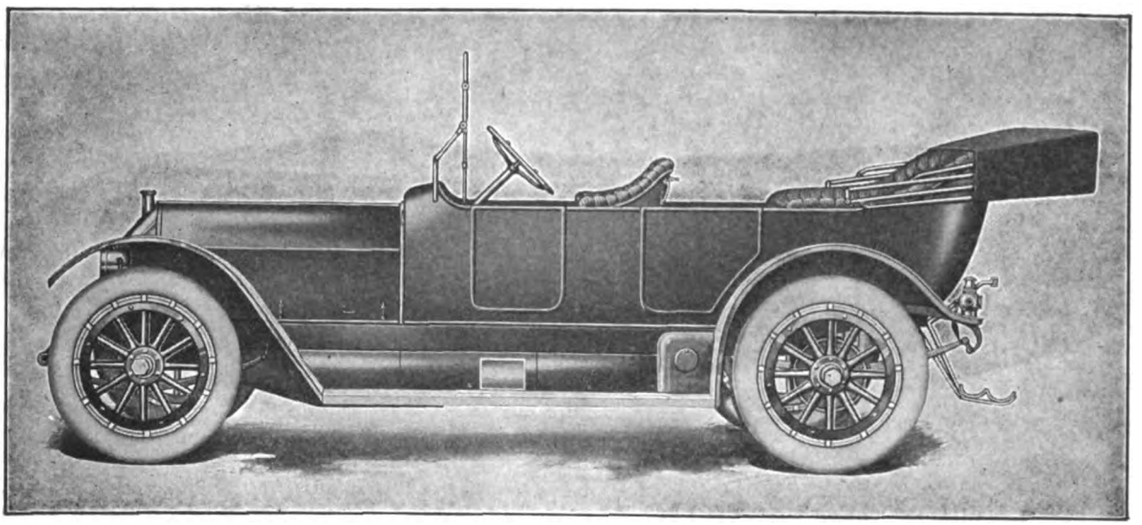
Testing Firestone Fabric

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ANNOUNCEMENT

1913 Pleasure Models

"If you have never driven one up a hill,
You have missed half the sport of motoring!"



A Knox Little Six—Model 46

A new distinctive car of unusual power, quietness, comfort and style, embodying the most advanced American and European ideas in approved design and construction. Among the important features of Model 46 are the V-shaped radiator, silent chain driven cam and magneto shafts, option on right or lefthand steer and unusual provision for taking up wear and preventing noise. **"The Car of Surprising Economy."**

Motor 6-cylinder, 4⅛" x 5½". A. L. A. M. Rating 46 H. P.
Wheel-base 130". Tires 37" x 5".

Price with all Open Type Bodies and Complete Equipment.....$4350
Price with Limousine Type Bodies and Complete Equipment..... 5350
Price with Landaulet Type Bodies and Complete Equipment..... 5400

60 H. P. Six—Model 66

An ideal, powerful, spacious family car, incorporating the famous Knox 6-cylinder motor in its fourth year of refinement without radical change.

Motor 6-cylinder, 5" x 5½". A. L. A. M. Rating 60 H. P.
Wheel-base 134". Tires 38" x 5½".

Price with all Open Type Bodies and Complete Equipment.....$5000
Price with Limousine Type Bodies and Complete Equipment..... 6200

4-Cylinder—Model 44

The lightest Knox model. Trim, comfortable, a powerful hill climber, quiet and flexible, embodying the famous Knox motor in its fifth year of service without important change.

Motor 4-cylinder, 5" x 5½". A. L. A. M. Rating 40 H. P.
Wheel-base 117" and 122". Tires 36" x 4½".

PRICES, COMPLETELY EQUIPPED

2-Passenger Raceabout	$3300	7-Passenger Touring Car	$3550
Double Rumble Raceabout	3350	5-Passenger Touring Car	3500
4-Passenger Torpedo	3400	2-Passenger Coupe	4300
5-Passenger Torpedo	3450	Limousine	4400

4-Cylinder—Model 45

Longer body and wheel-base than Model 44. A roomy, comfortable family car. An ideal chassis for spacious, open and closed types of bodies.

Motor 4-cylinder, 5" x 5½". A. L. A. M. Rating 40 H. P.
Wheel-base 126". Tires 37" x 5".

Price with 6-Passenger Open Bodies and Complete Equipment.....$3700
Price with 7-Passenger Open Bodies and Complete Equipment..... 3800
Price with Limousine Bodies and Complete Equipment..... 4700

Knox 4-cylinder models are completely equipped, including electric side and tail-lamps with storage battery, acetylene starters and automatic gas lighters for headlights.

Knox 6-cylinder models are regularly equipped with self-starters and dynamo lighting systems.

Send for Folder with Detailed Specifications.

KNOX AUTOMOBILE COMPANY, Springfield, Mass.

New York — BRANCHES — Chicago

"A Demonstration is Irresistible"

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Hartford Pointers—No. 5

More Tire Mileage—and Easy Riding

IF greater tire mileage is what you seek, learn how the Truffault-Hartford Shock Absorber prolongs the life of tires.

Tires are short-lived, because of the abuse they receive.

From the very nature of their construction, they cannot withstand thumping and bumping over rough roads.

How to provide against this ill-use is a question only the Truffault-Hartford Shock Absorber can decide.

This device does away with the thumping and bumping by providing a proper control to the springs. It keeps the wheels of the car constantly on the ground, thereby eliminating the jumping of tires caused by e..cessive spring action and rough roads. But the utility of the

Truffault-Hartford SHOCK ABSORBER

is not confined to tire-saving alone. It is invaluable to economical upkeep and easy riding. Through the perfect control it exerts over spring action, wear and tear on the engine and parts is greatly reduced—vibration minimized—and the jolts and jars of traveling over rough roads effectually combated.

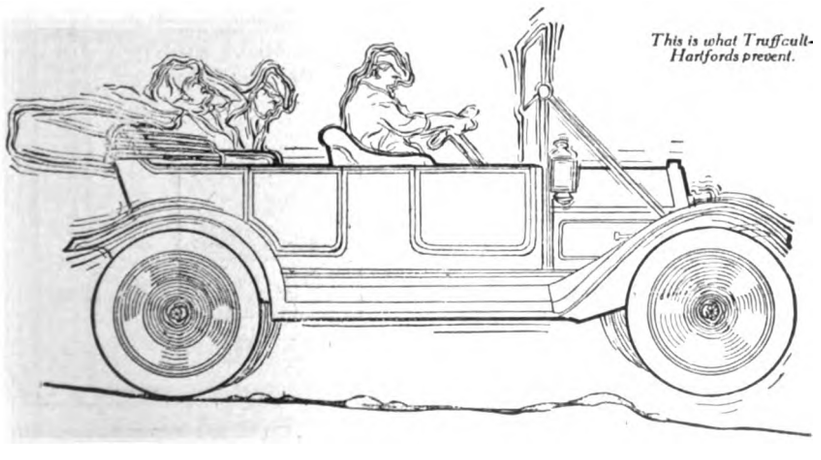
The improvement the Truffault-Hartford works in the riding qualities of a car is not to be recorded in mere words. You must ride in a Truffault-Hartford-equipped machine, over roads of your own choosing, to realize how great is the benefit conferred by the use of this device.

In the Truffault-Hartford, the chief objection to shock absorbers is overcome. This device assuredly *does not* lessen the flexibility of the spring. The rotary friction principle upon which it is built reveals the reason.

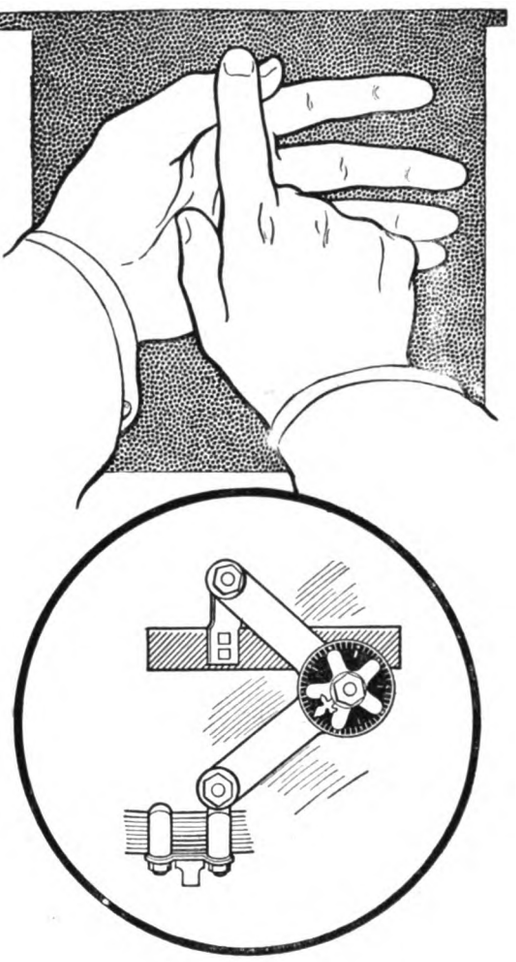
Rotary friction, as applied *only* in the Truffault-Hartford, means a slight but constant frictional resistance to *both* the downward and upward movements of the spring—such a resistance as allows for the normal full play of the spring at all times, but prohibits the spring operating outside of its normal working limits.

Twenty-four of America's leading cars carry Truffault-Hartfords as regular equipment—a fact of no little significance to the man who would use the equipment sanctioned by America's foremost automobile builders.

Four Models—$60, $45, $25, $15.



This is what Truffault-Hartfords prevent.



Ask your dealer for further information and write us for our handsome illustrated catalog which embraces many other valuable points impossible to cover in an advertisement. Write for it today.

The Hartford Suspension Co.
E. V. HARTFORD, Pres.

164 Bay Street Jersey City, N. J.

BRANCHES

NEW YORK.....1700 Broadway
NEW YORK.....212-214 West 88th Street
JERSEY CITY.....141-143 Morgan Street
BOSTON.....319-325 Columbus Avenue
CHICAGO.....1458 Michigan Avenue
DETROIT.....803 Woodward Avenue
KANSAS CITY.....1524 Grand Avenue
NEWARK.....289 Halsey Street
PHILADELPHIA.....1437 Vine Street
ASBURY PARK.....Ocean and 3rd Avenues

Spring action being necessary to secure easy riding, auto owners should avoid so-called shock absorbers working on the **eccentric** cam and **wedging** principles. Such devices limit the play of the spring creating a condition undesirable, if not actually dangerous.

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"The Horn that's Made for the Discriminating"

TUTO HORN

THE TWO TONE HORN

Best All Round Warning Signal.

THERE are many electrical warning devices on the market, all claimed by their respective makers as the best.

¶ We do not take issue with these claims, for some particular warning device might be considered best for a very limited service, and by those not completely versed in the art.

¶ The TUTO Horn is not limited in its operation to fit some particular condition. It is a complete warning device and does all of the signalling for the car.

¶ It is the only warning signal that produces two distinct service notes, one of low abrupt character for regular use, replacing the inadequate bulb horn, and a louder tone for emergencies.

¶ The low note of the TUTO Horn gets the right-of-way 90% of the time and without undue disturbance—courteous and economical in operation.

¶ Unlike the bulb horn, supplemented by the one-loud-note electric horn, the TUTO Horn allows the driver to go from low to loud instantly and without moving a hand, simply the giving of a further pressure on the same button that is used in producing the milder signal.

¶ This makes the TUTO Horn absolutely safe in case of emergency, no confusion, no extra mental effort necessary when every thought must be directed to the controlling of the car. The act of gripping the steering wheel, as danger approaches, forces the thumb clear down on the TUTO button, automatically demanding attention with the loudest tone of the horn.

¶ Close range service is most vital in the saving of life, limb or property. At a distance the car driver has time to think and act and most any one-note warning device will serve the purpose.

¶ The TUTO Horn is fitted for all conditions and is pronounced, by those who know, to be the only real emergency signal.

¶ In addition to these superior service values, the TUTO Horn is the only warning device which comes complete with special fittings for making a most neat and permanent job of installation on any car. It is best to use the TUTO Horn for standard equipment and it is not out of place to request that the TUTO be furnished on your new car

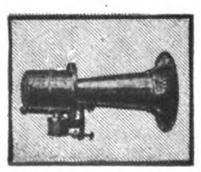


TUTO Horn, $25.00

The Dean Electric Co.

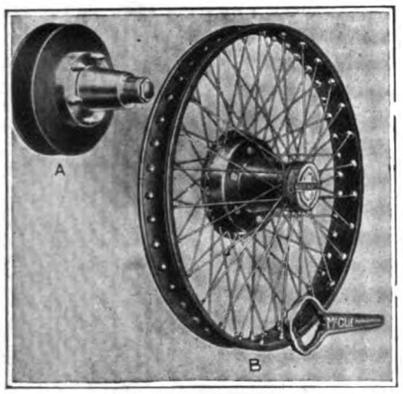
260 Taylor Avenue, Elyria, Ohio

"Look for Dean where Quality's seen"



TUTO-ETTE $17.50

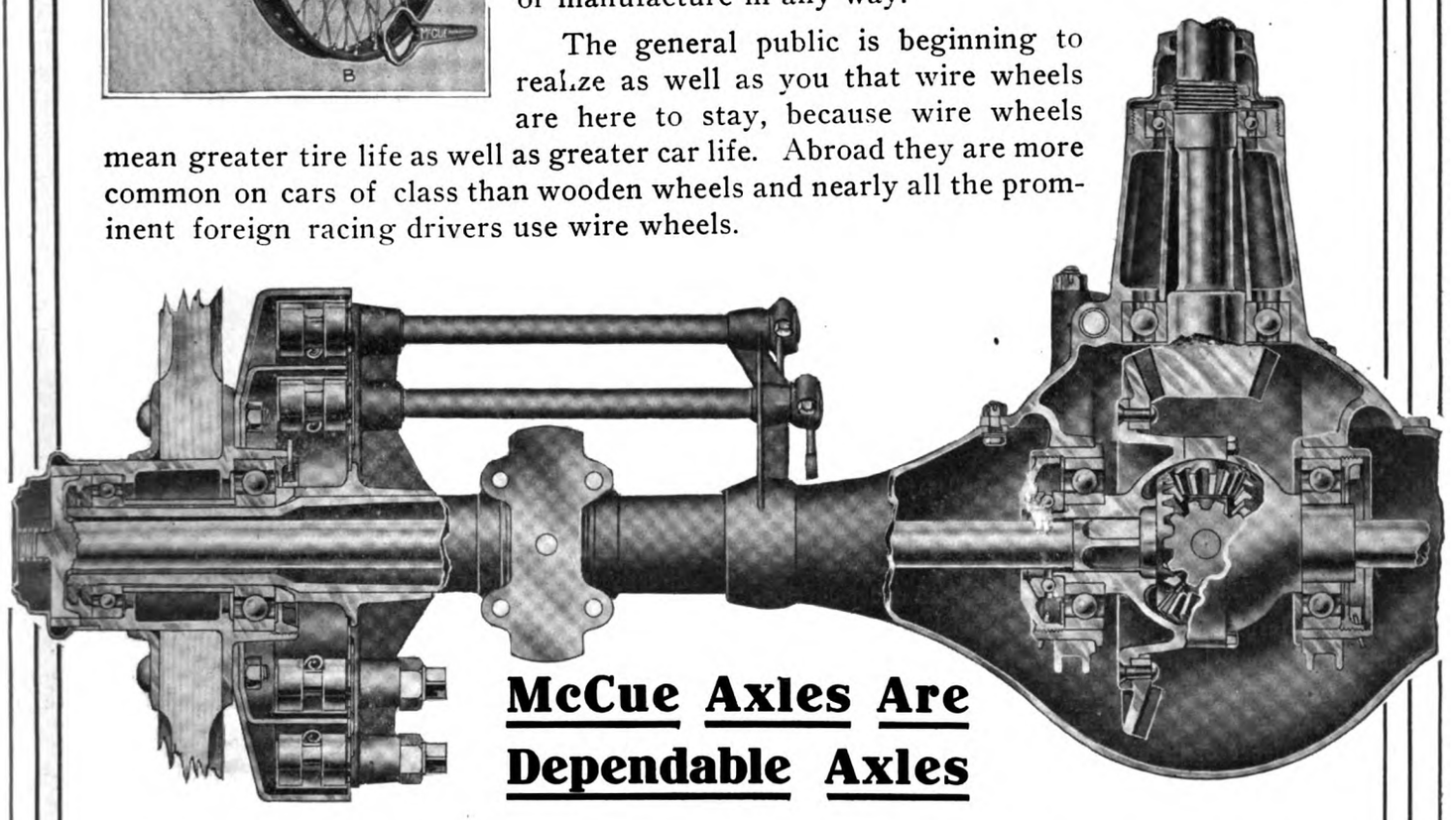
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McCue axles and McCue wire wheels mean the greatest advancement in car design and construction. McCue axles are so built that they will admit of the use of either wire or wooden wheels on the same spindle.

This simplifies matters for the manufacturer, because he can now offer either wire wheels or wooden wheels as optional equipment without interfering with his design or manufacture in any way.

The general public is beginning to realize as well as you that wire wheels are here to stay, because wire wheels mean greater tire life as well as greater car life. Abroad they are more common on cars of class than wooden wheels and nearly all the prominent foreign racing drivers use wire wheels.



McCue Axles Are Dependable Axles

The entire load is carried on the housing, which is made of sheet steel, one piece from end to end, without tubes, telescoped into the ends for spindles. The shape of the housing is such that it is a truss within itself and so constructed as to allow a factor of safety of 20 to 1, before even bending.

The brake adjustment is strictly our own, so designed that when once the brake rods are properly adjusted they need never be disturbed again. This is accomplished by the use of adjusting cams at the rear of the drums. There is sufficient adjustment in these adjusting cams to allow for the complete wearing out of the brake lining.

THE McCUE COMPANY

BUFFALO NEW YORK

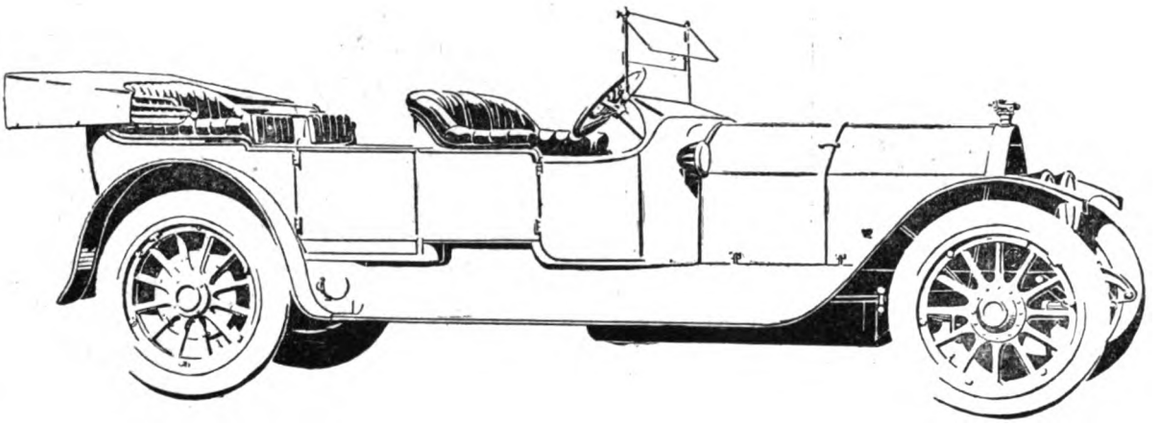
70% MORE TIRE MILES

WIRE McCUE WHEELS

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The Easiest Riding Car In The World

The MARMON SIX



Six Cylinders—4½ in. Bore, 6 in. Stroke, 48-80 Horse Power—$5000 Fully Equipped.

Announcing The Marmon Six

In announcing the Marmon Six we will say that so far as any test can be applied it is a proven car—a car that will live up to the reputation of the Marmon name.

During the years the Marmon Six has been under development and test—in the shop, in road service and in many of the world's most important races—we believe we have overlooked nothing that would add to the quality and capability of the car or that would enhance the safety, the comfort or the convenience of its user.

Its mechanical superiority and durability, its even balance, its ease on tires, the efficiency of its lubrication, its power and smoothness of operation, have been proven by such tests as the winning of the 200 mile Wheeler-Schebler Contest on May 30, 1910, and the First 500-Mile International Sweepstakes race, May 30, 1911. In these contests a Marmon Six was pitted against the largest and most representative field of European and American cars ever entered in any race and in both events the Marmon won.

Among its many new and exclusive features is the lubrication by means of the Marmon system of automatic force feed, delivering oil not only through the hollow crank shaft but also to the cam shaft bearings through hollow cam shafts. The front axle is another new and distinctive feature first introduced with this model. The vertical spindle is placed directly in the center line of the wheel making the surest, safest and easiest steering mechanism ever devised. It permits this car with 145-inch wheel base to be turned in a forty foot street. Other original and effective mechanical improvements are incorporated—every one of which has been tried and proven up to the Marmon standard of excellence.

The thorough equipment leaves nothing to be desired in the way of convenience for the motorist. It includes a cape top, new type wind shield, self-starter and dynamo electric lighting system, electric horn, speedometer with clock, shock absorbers front and rear, power tire pump, tire carrier, extra demountable rim, coat rail, foot rest and tool equipment.

The bodies with their graceful, symmetrical lines, their deep and luxurious upholstering and the many refinements, added to the strength of the Marmon perfected cast aluminum construction, are the best examples of the art of body design and building. There are seven, five, four and two passenger types—the price, f. o. b. factory, Indianapolis, is $5000 with full equipment. Limousine, $6,250; Landaulet, $6,350.

Nordyke & Marmon Company

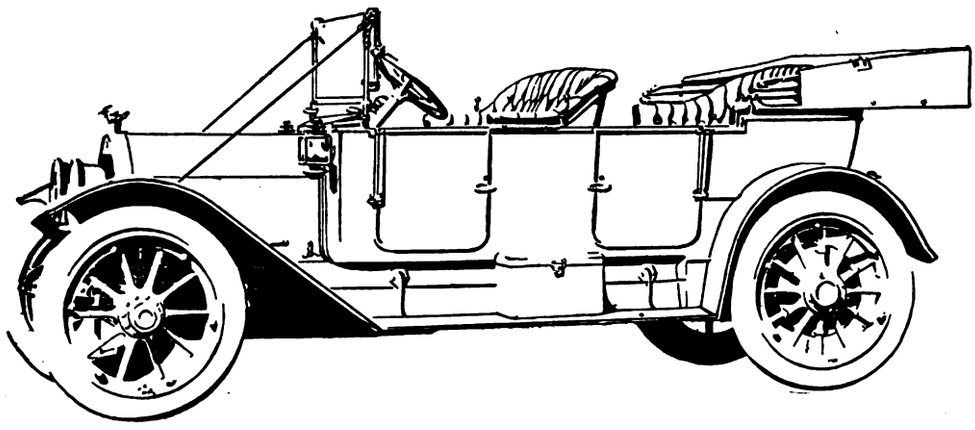
Indianapolis (Established 1851) **Indiana**

Sixty Years of Successful Manufacturing

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The Easiest Riding Car In The World

The MARMON "32"



Four Cylinders—4½ in. Bore, 5 in. Stroke—32-40 Horse Power—$3000 Equipped.

Announcing a New Series of The Marmon "Thirty-Two"

The features which in the past have built up so great a name for the superiority of Marmon design, materials and construction are not materially changed in this new series of the Marmon "Thirty-Two."

It is moderate in size and capacity, light in weight with an abundance of power, exceptionally well proportioned and well balanced and will meet every requirement of city use and touring with the greatest comfort and economy.

The motor remains unchanged except for the addition of an electric lighting dynamo. The clutch pedal has an adjustment and increased leverage of the clutch throwout. The brakes, which have already received the highest praise from experts, are even further improved by a combination facing of asbestos fabric lining and composition metal in alternate segments on the brake shoes. An improved, simple brake adjustment has also been added which gives another point of Marmon superiority in its extreme accessibility and effectiveness. This is a new and distinctive feature brought out with this new series and the Six.

The equipment furnished with the new series of the Marmon "32" consists of: Pantasote Cape Top, dust boot, improved Marmon special ventilating wind shield, speedometer with clock and electric light, horn with bulb on steering column, dynamo electric lighting system with storage battery, electric headlights, combination oil and electric dash and tail lights, self-starter with Prest-O-Lite Gas Tank, shock absorbers on rear, extra demountable rim, single tire carrier, coat rail, foot rest, jack, pump, tire repair outfit and compelte tool equipment.

The five passenger Touring and four passenger Suburban bodies have extra deep rear seat cushions which give an added luxury and comfort. Either body type with equipment as above, $3,000 f. o. b. factory, Indianapolis.

Roadster type with single rumble seat or trunk and with top and complete equipment, $2,900. Speedway type speedster without dash lamps, top or windshield, but with shock absorbers front and rear, double tire carrier and extra rim, $2,850. Limousine $4,000, Landaulet $4,100.

Nordyke & Marmon Company

Indianapolis (Established 1851) Indiana

Sixty Years of Successful Manufacturing

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SOME neglect opportunities—others do not wait for them.

¶ We warn you now. The BIG opportunity of the automobile trade will appear on August 17th, when we make our announcement.

¶ Dealers need not wonder what Overland will do. We tell you *now* we will make a startling bid for your contract signature.

¶ We have always kept our promise. We will keep *this one* with a vengeance.

The Willys-Overland Co., Toledo, Ohio

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THE MOTOR WORLD

Vol. XXXII New York, U. S. A., Thursday, July 11, 1912. No. 3

MAY FORM FOUR FOREIGN COMPANIES

De Lisser's Visit to Europe Fraught With Far-Reaching Importance—Tire Situation Has Aroused Car Makers.

Having resigned the vice-presidency of the United States Motor Co. and returned to his earlier love, the Ajax-Grieb Rubber Co., as chairman of its board of directors, Horace De Lisser now is preparing to sail for Europe on the 30th inst. It first was stated that the purpose of his business is to forward plans for the establishment of an Ajax tire factory in Europe, but later and authentic information makes clear that De Lisser's plans reach much further and that, instead of one foreign factory, four of them are within the realm of probability, one each in Great Britain, France, Germany and Belgium.

It appears that abroad the "take it or leave it" policy largely prevails, three tire manufacturers practically controlling the trade of Great Britain and the entire Continent. They are so strongly intrenched that no guarantee attaches to their tires, and in many respects it is difficult to budge them—so difficult that, having become cognizant of the origin of the Ajax-Grieb Rubber Co. and what it had accomplished in this country, certain of the automobile manufacturers have made overtures to the Ajax-Grieb people to undertake similar enterprises abroad. The overtures are of a well-defined nature, but the outcome naturally depends largely on the results of De Lisser's pending visit.

The Ajax-Grieb Rubber Co., as will be recalled, grew out of a somewhat strenuous, if not arbitrary, situation which prevailed in the tire trade in this country. Believing that the tire manufacturers were too greatly in agreement in respect to prices and policies, and too unbending generally in their attitude toward large buyers, the Maxwell-Briscoe Motor Co., the Ford Motor Co. and others became stockholders in the Ajax-Grieb enterprise and in this way gave it an immediate foundation and a ready market for its products. Its success, naturally, was instantaneous and continued.

The foreign automobile manufacturers whom De Lisser will visit believe that a tire company, if not four of them, similarly organized, can be made as profitable in Europe as in America. It is understood that if present plans come to a head, these manufacturers will subscribe 50 per cent. of the stock in the Ajax foreign corporations.

Abbott's Head Succumbs to Long Illness.

After an illness of about one year, Charles W. Jamieson, president of the Abbott Motor Co., of Detroit, Mich., died at his home in Warren, Pa., on Saturday afternoon last, 6th inst. Jamieson first became identified with the Abbott Motor Co. at the time of its reorganization about two years ago, at which time he invested heavily in the stock of the company and was made its president and became a really active worker, being chiefly instrumental in further developing the company. In addition to his interest in the Abbott Motor Co., Jamieson was one of the largest independent oil refiners in the country, was president of the National Bank of Warren, Pa., and was heavily interested in other mining and manufacturing corporations. The management of the Abbott Motor Co. will remain unchanged and for the present will be in charge of F. N. Knapp, a director, who has directed the Abbott affairs during Mr. Jamieson's illness.

Simms Here to Assist Reorganization.

The reconstruction of the Simms Magneto Co. of Bloomfield, N. J., the control of which company some three weeks ago passed into the hands of men closely identified with the Assets Realization Co. of New York City, at which time details of the transaction were published in the Motor World, is expected to take tangible form within the next few days, President F. R. Simms having arrived from England, where he resides. The purpose of his visit is to attend a meeting of the stockholders which has been called for to-morrow (Friday), when, it is expected, a definite plan of action will be reached.

DURANT AGAIN IS "DOING THINGS"

Forms $65,000,000 Corporation With Ten State Subsidiaries—Each Will Manufacture Little Cars, Including "Six" at $1,000—Chevrolet Car Involved.

W. C. Durant is again on the road to complete happiness. It is no secret that since the control of the $40,000,000 General Motors Co., which he organized, passed out of his hands Durant has been restless—so restless that, while remaining a director and vice-president of the General Motors Co., he has placed irons of his own in the fire, among them the Chevrolet Motor Co., in Detroit, and the Little Motor Car Co., in Flint, Mich.; and these properties, it now transpires, are to form the basis of a $65,000,000 corporation which, to all practical purposes, will be Durant's own. It will be styled the Republic Motor Co., and Durant will be its vice-president and general manager. It is being incorporated under the laws of Delaware and is one of those immense projects which seem essential to Durant's happiness.

Despite the size and far-reaching character of the enterprise, Durant has been uncommonly successful in keeping the details to himself. For the Delaware corporation is to be the mother of ten other corporations located in as many states and bearing the same name. The first of them, the Republic Motor Co. of New York, was practically completed late last week, when it was incorporated under the laws of New York with nominal capital of $500, which, however, shortly will be increased to $1,500,000. It already has secured a large plant in New York City, where, under license of the Little company, the Little cars—a runabout at $715 and a six-cylinder touring car at $1,000—will be reproduced in New York City itself. The Republic company will have also the exclusive selling rights to the Chevrolet "sixes," which, however, will be produced only in Detroit. The property purchased covers the entire

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block on Eleventh avenue between 56th and 57th streets, part of which was occupied by Rothschild & Co., the once well known body builders. The contract for remodeling the plant has been let and the work is well under way. When completed, the Republic Motor Co. of New York will be possessed of floor space equal to 111,341 square feet.

Similar plants are to be established in Philadelphia, Boston, Cincinnati, St. Louis, Minneapolis, Kansas City, Portland, San Francisco and Los Angeles, each of which, as previously stated, will be operated by a separate company bearing the name Republic and making Little cars, but all of them subsidiary to the parent Delaware organization.

In addition to the New York company, the Michigan company also has been incorporated. It is styled Republic Motors of Michigan and is nominally capitalized at $2,000, of which Durant holds four shares, R. T. Armstrong, of Detroit, four shares, and Theodore G. Sprague two shares. Armstrong is president of the J. B. Armstrong Mfg. Co., of Flint, which makes automobile springs, and Sprague is one of the mechanical experts of the Chevrolet Motor Co.

Durant still remains vice-president of the General Motors Co., but he now makes New York his headquarters, and while he freely and courteously confirms the general outline of his plans, as it is here detailed, he very courteously but more firmly declines to give the names of any of his associates in the huge enterprise. He admits that he will be vice-president and general manager and have direction of the entire project, but until the officers of the several companies are elected, which will come to pass within a comparatively short period, he will say nothing concerning the men he has gathered around him. He did admit, however, that the officers of the ten subsidiary companies will be men drawn from the States in which the plants will be established, but more than this he will not say regarding that phase of the matter. He also made clear that the ten plants are to be not mere assembling institutions, but complete factories. They will manufacture or purchase such parts as are required for the Little cars exactly as the Little company itself now purchases or manufactures them. In other words, the ten factories will not draw their supplies from the Little plant and the cars they produce will incorporate particular features or particular equipment that may be in demand in their respective territories. "Built on the Spot" is to be the Republic slogan, it being Durant's idea that most of the waste and much of the expense incident to the marketing of automobiles can be eliminated. As he expresses it, the problem to-day is not production but distribution. He believes he has solved it.

After the control of the General Motors Co. passed to other hands, it was fairly well known that Durant sought to effect a merger of several large and prominent companies whose names are almost household words in the automobile industry, but he failed to receive sufficient support or encouragement and the undertaking apparently has been abandoned; but grown used to doing large things in a large way, he quietly set about organizing a big company of his own, the Republic Motor Co. being the concrete result. Its proposed capital, $65,000,000, is so huge as to suggest that Durant has not wholly lost sight of the possibilities of future mergers, but on Tuesday last when he was asked point blank whether the Republic Motor Co. would include any other company or companies, or whether anything of the sort was in view, he promptly denied intentions of the sort, stating that the parent Republic company, which will be the $65,000,000 organization, will be composed wholly of the ten Republic companies which are to be organized in the several states.

The Little and the Chevrolet cars, which constitute the Republic backbone, are of the sort that cannot fail to command notice. Both will be listed at popular prices. The figures, particularly as they apply to "sizes," which now loom so large, are likely to exert no small influence in the trade. The Little "four," a 20-horsepower, two-passenger runabout, already is being marketed, lists at $690 f. o. b. Flint or $715 in New York, while the Little "six" touring car, which is being made ready, will sell for the astonishingly low price of $1,000. The Chevrolet car will be made in two models, both "sixes," a little one and a big one. The Chevrolet "little six" will list at $2,000, fully equipped; the price of the larger model has not been definitely settled. The former is just about ready for the market, and it is not too much to say that it is a truly impressive creation; it is splendidly designed and splendidly made, and includes several novel features that are certain to attract general notice.

Locomobile and Stearns Stiffen Prices.

Apparently the Packard company will stand the only manufacturer of high-priced products to reduce prices, for both the F. B. Stearns Co., Cleveland, O., and the Locomobile Co. of America, Bridgeport, Conn., whose products are well known as rightfully belonging among the "upper ten," so to speak, have made slight increases in their prices. The Locomobile company has added $100 to the list of its four-cylinder model and its small six-cylinder model, which henceforth will list at $3,600 and $4,300, respectively, and $200 to the list price of its large six-cylinder model, which heretofore sold for $4,800. In the case of the Stearns company, the increase has been more substantial, the reason being, it is given out, that the cost of materials and labor is attempting to keep pace with the soaring prices of foodstuffs and other commodities which come under the general heading "cost of living." Last year the list price of the chassis mounted with any type of open body was $3,500; this year the two-, four- and five-passenger open cars list at $3,750 and the seven-passenger car at $3,900. In keeping with the high quality of workmanship and finish, to say nothing of the actual size of the car itself, the price of the recently added Marmon "six" has been set at $5,000, thus marking the entry of the Nordyke & Marmon company into the ranks of the manufacturers of high-priced cars.

Asks $10,000 for Broken Contract.

Two years as dealer in New York and vicinity for the Niagara Lead & Battery Co., of Niagara Falls, N. Y., is worth $10,000, according to an action now on the general calendar of the Supreme Court for New York County, wherein A. H. Green, of the A. Hazen-Green Co., 1686 Broadway, asks that amount, alleging that his contract as dealer in the company's storage batteries was cancelled by the Niagara Falls concern. The contract in question was for three years, so the complaint alleges, and was permitted to run but about one year, being terminated in the summer of 1911. Meanwhile, Green is busy with other accessories and devices, while the Niagara business is now in other hands. Green states that he had the Niagara business on the way to a large development when the contract was revoked.

Disputed Bill Leads to Attachment.

Albert Martinez, as the assignee of the Vanguard Mfg. Co., of Joliet, Ill., on Tuesday last, 9th inst., served an attachment upon the United States Motor Co., of New York. The amount involved is $3,748.21, covering a bill for Vanguard windshields. Benj. Briscoe, president of the United States Motor Co., states that the amount represents a disputed account and that it will be taken care of in due course by the company's legal staff, and is without other significance than that a creditor permitted himself to become unduly exercised.

Hood Leaves Factory to Join Retailers.

Wallace C. Hood, whom Paul Smith replaced as manager of the Everitt Motor Car Co. of Detroit, has acquired an interest in the firm of J. S. Harrington & Co., 589 Boylston street, Boston, and already has removed to that city to take up his new work. The firm, which maintains branches in Providence and Worcester, handles the Everitt car in New England, so that Hood's duties will not be wholly strange to him.

Weed Enjoins a Connecticut Jobber.

On the application of the Weed Chain Tire Grip Co., of New York, the Federal court in Hartford last week temporarily enjoined Henry Horton, a New Haven (Conn.) jobber, from selling the Whittier chain tire grip, made by the Whittier Chain Tire Grip Co., of Boston. The Whittier grip is "anchored" with leather straps and is claimed to be an infringement upon the Parson-Weed patent.

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EDWARDS COMPANY INCORPORATED

Capitalized at $2,000,000 and C. G. Stoddard Chosen President—Factory To Be In Vicinity of New York City.

After several months of careful preparation, during which time unfounded rumors concerning the plans of the company have been particularly plentiful, the Edwards Motor Car Co. at length has been duly incorporated, the papers bearing the seal of the State of Maine. The amount of the capitalization is $2,000,000, of which $750,000 is preferred and $1,250,000 common stock. As was to be expected, C. G. Stoddard, who has been the principal moving spirit in the venture, is president; H. J. Edwards, his colleague, is vice-president and general manager, and John F. Campbell, who formerly was treasurer of the Dayton Motor Car Co., with which company both Stoddard and Edwards at one time were intimately connected, is secretary and treasurer of the new company.

Though production plans covering the Knight-engined pleasure and commercial vehicles which the company will manufacture are well in hand, it is still undecided exactly where the factory will be located. It has been definitely settled, however, that the plant will be in the immediate vicinity of New York City. Sites in both Long Island City and close by in New Jersey are now being considered, though it may be several weeks before one or the other is chosen. It is planned eventually to produce both the pleasure and commercial vehicles in the same factory in order to center activities, though as was told three weeks ago in the Motor World, the production of trucks already has commenced in the factory of the Longest Bros. Co. in Louisville, Ky., which plant, together with patents and equipment, recently was acquired by Stoddard and Edwards for the purpose. Not more than 25 vehicles will be completed at Louisville, however. The active production of both types of vehicles will be commenced in the new plant in the East immediately it is acquired, and so far along are plans that it is expected that both cars and trucks will be ready for early Fall delivery.

Prest-O-Lite to Take New Tack.

Having had more rather than less success with its legal battles to establish its patent rights to the manufacture and refilling of its tanks, the Prest-O-Lite Co., of Indianapolis, Ind., now contemplates action of an entirely different nature, this time prosecuting under a statute which forbids the refilling of a trademarked container, such as labeled whiskey bottles, tobacco bags, etc., it being held that the Prest-O-Lite tank comes within this limitation. Hitherto actions for refilling have been for infringing the Prest-O-Lite patent, No. 664,383, but since a recent decision by Judge Kohlsaat in United States District Court in Chicago held that the patent in question has expired, the opponents of the Prest-O-Lite concern have believed they have some chance at law, even though numerous other high courts have decided contrary to Judge Kohlsaat, and it is expected that refilling therefore will be more frequent. Papers are being prepared by Winter & Winter of New York City, and the first actions will probably be begun within a few days in New York. Each penalty is a fine of $100.

Mott and Hayes Form Rim Company.

Although the Mott Wheel Works, of Utica, N. Y., has not established a branch factory in Jackson, Mich, as rumor had it, Otis W. Mott and C. B. Williams, of that company, have joined with Clarence B. Hayes, Winthrop Withington and Mark Merriman, of the Hayes Wheel Co., of Jackson, and have formed the Jackson Rim Co., which is capitalized at $100,000, and of which Mott is president, Hayes vice-president, Withington secretary and Merriman treasurer. The new company will locate in the Michigan city for which it is named, though just where the factory will be located has not yet been definitely decided. Though several of the men whose names are linked with that of the new company are intimately connected with the Mott Wheel Works, emphasis is laid on the fact that the Jackson Rim Co. is a distinct corporation and is in no way connected with any other company. As its name implies, it will specialize in the making of metal rims and other small parts.

Receiver Seeks to Sell Atlas Plant.

Fred. C. Gardner, who last week was appointed receiver for the Atlas Engine Works, of Indianapolis, Ind., has filed a petition in Judge Weir's room of the Superior Court, asking permission to sell the property and holdings of the company. In the petition Gardner sets forth that the indebtedness of the company approximates $1,000,000 and that in his opinion it will be impossible to obtain sufficient money to continue the plant in operation, and that if it were shut down considerable loss would result. The argument will be heard today.

Veerac Seeking Site in California.

According to reports from the Pacific Coast, the Veerac Motor Co., of Anoka, Minn., is seeking a factory site in Richmond, Cal. It is stated that negotiations are being carried on with a Richmond real estate firm and have for their purpose the establishment of a large truck factory on the coast.

Henry Ford Sails to Europe Saturday.

Henry Ford, president of the Ford Motor Co., of Detroit, Mich., will sail to Europe on Saturday, 13th inst., where he will remain several weeks. While Ford's visit will be largely in the pursuit of pleasure, it is certain that his commercial eye will remain wide open.

COURT DEFINES "SATISFACTION"

Says it's a "Mental Process" in Discussing a "Satisfaction Contract"—Then Reverses Decision of Lower Court.

When the Circuit Court of Wayne County, Michigan, Judge James O. Murfin, sitting, reversed the decision of the lower court and ordered a new trial in the case of Isbell vs. Anderson Carriage Co., William G. Isbell, the plaintiff, having received a verdict of $23,476 damages for alleged breach of contract, much light was shed on the meaning of the phrase "satisfaction contract," and, incidentally, a concise definition of the word "satisfaction" was given, this state being, in the words of the learned Michigan justice, "primarily but a mental process." The action in which the original verdict was handed down was instituted by Wm. G. Isbell against the Anderson Carriage Co. and was to recover damages for alleged breach, by wrongful termination, of a contract giving the plaintiff and one George D. Grant the agency for the sale of Anderson electric automobiles during a period of five years.

At the time of entering into the contract, Isbell and Grant were associated as partners and agreed by the terms of the contract to "establish the Anderson Electric Agency for the exclusive sale of the cars and electric automobiles that are made by the Anderson Carriage Co.," which at that time (1907) just had placed its vehicles on the market, though only one of them had been disposed of. The principal bone of contention was a phrase in the contract to the effect that the manner of conducting the agency was to be "such as will at all times be satisfactory to the Anderson Carriage Co.," and it was over the cancellation of the contract for alleged dissatisfaction after about 5½ months' duration that the action was commenced.

It was about three months after the contract had been put in force that trouble manifested itself, the Anderson Carriage Co. serving written notice on Isbell to the effect that the contract was not being carried out in a satisfactory manner. There were 12 itemized particulars in which it was claimed satisfaction was not forthcoming; they ranged all the way from "lack of advertising in the daily papers" and failure to employ competent help to a business policy which was not such as "to foster the sale and use of Anderson electrics in the city of Detroit." In the same communication it was intimated that unless these matters were corrected within 60 days, as prescribed in the contract, the Anderson Carriage Co. would consider the contract canceled. In replying, Isbell and Grant vigorously denied that the particulars named in the notice were borne out by the facts or that they had failed to observe their contract. Nevertheless, on March 2d, following, the An-

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derson Carriage Co. sent them written notice that, owing to their failure to carry out the conditions of the contract "the same is hereby canceled."

During the continuance of the trial, amendments to the plaintiff's declaration were filed and a third count added. In it it was averred that the defendant "was not at any time in good faith and honestly dissatisfied with any of the actings or doings of the said Isbell and Grant . . . and that the defendant had repeatedly expressed satisfaction therewith, but that on March 2d, 1908, with fraudulent, surreptitious and ulterior design to cancel the said contract and to be freed of the duties and obligations therein imposed upon the said defendant, and to unlawfully and fraudulently make other arrangements in relation to the sale of its said cars, which did on said date cancel said contract."

It was on this amendment that the issue was taken and on which the case virtually hinged. In rendering decision, the court said in reference to it:

"The issue was raised in this case by plaintiff's amended declaration. To maintain it plaintiff introduced evidence of repeated expressions of approval and satisfaction, by Anderson, as to what was done and the general method of conducting the business, up to the time the notice of December 31 was served and of refusal to confer or co-operate thereafter; of dealings by defendant with others which resulted in a contract giving them the agency on better terms for defendant, before the sixty days specified in the contract and notice had expired. While the provision found in the supplemental contract, that sixty days' notice shall be given to correct any error or mistake that may arise in carrying out the conditions outlined in paragraph number two of said contract, is somewhat obscure and does little to illuminate the doubtful portions of the paragraph referred to, it does make plain that when dissatisfaction first arises another chance will be given, during a period of sixty days, to make things satisfactory before a final decision is reached. Good faith and an honest compliance with this require that, during the sixty days, defendant shall reserve judgment, remain in a receptive mood and be ready and willing to co-operate and approve, if possible, to the end that the contract may continue if the causes of dissatisfaction shall be in truth removed."

The case at issue was a delicate one for the jury to decide, inasmuch as it had to determine whether or not the defendant actually was dissatisfied. In other words, it was necessary to ascertain exactly what constitutes satisfaction. In the lengthy decision that was handed down and in which there were many precedents quoted, the court summed up as follows, and, as already has been told, reversed the original decision and ordered a new trial:

"Contracts of this general character, known as 'satisfaction contracts,' in which one party agrees to perform his part to the satisfaction of the opposite party, are fruitful and frequent sources of litigation, owing to the disappointments they so often bring to the party who has taken the chance of performing satisfactorily, and the difficulty of ascertaining what really constitutes satisfaction, which, primarily, is but a mental process. Such contracts are enforcible, however, to the extent the intention of the contracting parties can be ascertained. If parties voluntarily assume the obligations and hazards of a satisfaction contract, their legal rights are to be determined and adjudicated according to its provisions. It is elementary that courts cannot make contracts for parties nor relieve them of the consequences of their contracts, however ill-advised.

"In many cases of this nature which have been before various tribunals, there is recognized two quite well-defined classes; one where the personal taste, feeling, sensibility, fancy or individual judgment of the party to be satisfied are especially involved, the other where mechanical utility or operative fitness in relation to which some standard is available, are bargained for. In the former class the authorities preclude disputing the propriety or reasonableness of the declaration of dissatisfaction on the part of the individual entitled to exercise it. It is said to be with him purely a personal matter of which he is made the sole judge. It being his right to say whether he is satisfied or not it cannot be left to another to say that he ought to be satisfied. In the latter class of cases the authorities are more conflicting. In numerous decisions it has been held, under the phraseology of the contracts being considered and the attending circumstances, that not only the honesty of the declared dissatisfaction may be questioned, but even in special instances, the adequacy and reasonableness of the ground for such action are open to investigation.

"We think the contract under consideration falls more closely within the former class. It was an agency in the nature of employment to render services involving something more than the operative fitness or mechanical utility of a tangible thing. It involved personal efficiency, energy, initiative, business experience and ability to formulate methods and make them successful, as well as co-operation and confidential relations with defendant, of such a character as to lead to the conclusion that the parties contemplated, and provided for, the right of defendant to terminate the relationship when, according to its own fancy and judgment, the work done and methods pursued were not satisfactory."

Peerless Branch Replaces Agency.

Deeming the time auspicious, the Peerless Motor Car Co. has taken over the business of the Automobile Sales Corporation, which handled the Peerless in Philadelphia, and hereafter will conduct it as a branch, which temporarily will be located in the Abbott Building, at Broad and Race streets. Later it will be removed and permanently established at 245-247 North Broad street, where a handsome salesroom and service department are being made ready. R. W. Cook, former sales manager of the Automobile Sales Corporation, will be manager of the branch, and among his lieutenants will be George J. Dunham, at one time president of the Royal Tourist Motor Car Co., of Cleveland, O.

Three Months for Purloining Salesman.

Even if the Randall-Faichney Co., on Causeway street, Boston, Mass., makers of Jericho horns did not get much in recovery for 150 automobile horns which disappeared while one Arvid O. Swanson was in their employ as a salesman, the concern has the satisfaction of knowing that Swanson has three months in the House of Correction in which to meditate upon the advisability of depleting his employers' stock without their knowledge. The horns were alleged to have been taken by Swanson, a few at a time, but when the matter reached court last week the total valuation was placed at $500. Swanson gave Somerville, Mass., as his home.

Willys Enters Hexter Truck Company.

Growing out of the recent purchase by John N. Willys, of the Gramm Motor Truck Co., of Lima, O., Willys has been elected vice-president of the Hexter Motor Truck Co., of New York City, which company handles Gramm trucks in the metropolitan territory and in which the Gramm company holds a stock interest. Coincident with Willys's election, which occurred at a director's meeting, George W. Bennett, Willys's lieutenant, was made a director of the New York concern. As heretofore, P. K. Hexter remains president and general manager and Arthur A. Alexander continues secretary and treasurer.

Collapse of Garage Causes $50,000 Suit.

A somewhat unusual cause of action is named in Circuit Court by the A. J. Davies Motor Co. of Kansas City, Mo., which asks $50,000 damages from George W. and Dallas M. Tourtellots because a building at 1708-10 Grand avenue, owned by the Tourtellots and occupied by the Davies company, collapsed in March last. The complainants state that they had $75,000 worth of cars in the structure and that when it came crashing down upon the brightly painted vehicles they were left in somewhat undesirable condition.

Iowa Tire Filler in Bankruptcy Court.

On Saturday last, 6th inst., William A. Daugherty filed a petition in bankruptcy against the Iowa Tire Filler Co., doing business at 1324 Michigan avenue, Chicago. The liabilities of the company exceed $1,000; its assets are not a matter of record. The company was organized under the laws of South Dakota during the latter part of 1911 with $35,000 capital stock, which later was raised to $50,000.

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THE WEEK'S INCORPORATIONS




Detroit, Mich.—General Castings Co., under Michigan laws, with $2,000 capital; to operate a foundry.

Detroit, Mich.—Power Truck Co., under Michigan laws, with $2,500 capital; to manufacture motor trucks.

Montpelier, Vt.—Union Transfer Co., under Vermont laws, with $2,500 capital; to operate a motor delivery.

Indianapolis, Ind.—Scheidel-Thompson Co., a Michigan corporation with $50,000 capital, admitted to do business in Indiana.

Franklin, N. H.—Herbert Mfg. Co., under New Hampshire laws, with $10,000 capital; to manufacture piston rings and other motor parts.

Minonk, Ill.—Minonk Garage Co., under Illinois laws, with $2,500 capital; to operate a garage. Corporators—D. L. Stimpert, I. R. Stimpert, R. E. Gray.

San Antonio, Tex.—Ford Sales Co., under Texas laws, with $5,000 capital; to deal in motor cars. Corporators—M. D. George, Clifton George, G. H. King.

Corinth, Miss.—Corinth Auto Co., under Mississippi laws, with $10,000 capital; to deal in motor cars. Corporators—W. A. Stewart, H. A. Hinton and others.

Detroit, Mich.—Parker Avenue Garage Co., under Michigan laws, with $10,000 capital; to operate a garage. Corporators—Herman F. P. Parker and others.

Flatonia, Tex.—Flatonia Automobile Co., under Texas laws, with $5,000 capital; to deal in motor cars. Corporators—E. A. Arnim, Donald McKay, C. P. Johnson.

Chicago, Ill.—Seek Auto Co., under Illinois laws, with $8,000 capital; to deal in motor cars. Corporators—James H. Seek, Herbert W. Crane, Emmet W. Mick.

Rye, N. Y.—Jacob Werner, Inc., under New York laws, with $1,000 capital; to deal in motor cars. Corporators—Jacob Werner, Ellen J. Werner, George J. Werner.

Camden, N. J.—Auto Distributers, Ltd., under New Jersey laws, with $200,000 capital; to deal in motor cars. Corporators—F. H. Hansell, I. C. Clow, J. A. MacPeak.

Far Rockaway, N. Y.—New Garage Co., under New York laws, with $1,000 capital; to operate a garage. Corporators—John A. Kilgallon, Michael J. Walsh, John J. Walsh.

Sidney, Ohio—Alumalux Co., under Ohio laws, with $5,000 capital; to manufacture solder, etc. Corporators—J. Henney, Robert E. Pfeiffer, Louis McAllister and others.

Camden, N. J.—International Motor Co., a Delaware corporation with $10,000,000 capital, admitted to do business in New Jersey with a principal office in Jersey City.

Weyauwega, Wis.—Weyauwega Garage Co., under Wisconsin laws, with $5,000 capital; to operate a garage. Corporators—E. H. Jones, F. W. Bauer, Claude Hinchey.

Syracuse, N. Y.—Jefferson Garage Co., under New York laws, with $30,000 capital; to operate a garage. Corporators—Antonia Matzene, Charles J. Roehm, Charles J. Baumer.

Wilmington, Del.—Rutenber Motor Co., under Delaware laws, with $1,350,000 capital; to manufacture motors. Corporators—Norman P. Coffin, W. Maloney, Herbert E. Latte.

Dover, Del.—Auto Signal and Mfg. Co., under Delaware laws, with $100,000 capital; to manufacture motor car devices. Corporators—H. H. Nobel, E. G. Ott, T. H. Humphry.

Buffalo, N. Y.—L. G. Schoepflin Co., under New York laws, with $10,000 capital; to deal in motor cars. Corporators—Louis G. Schoepflin, L. O. Schoepflin, Herbert G. Schoepflin.

Chicago, Ill.—Chicago General Motor Bus Co., under Illinois laws, with $1,000 capital; to operate a 'bus line. Corporators—Henry W. Berg, W. C. Norton, John Reckinger.

Rochester, N. Y.—Shafer-Decker Co., under New York laws, with $50,000 capital; to deal in motor cars. Corporators—C. P. Huge Schoellkopf, Charles P. Shafer, Frederich Decker.

Dover, Del.—Auto Development Co., under Delaware laws, with $500,000 capital; to manufacture motor car devices. Corporators—F. R. Hansell, G. H. B. Martin, S. C. Seymour.

Syracuse, N. Y.—New York Motors, Inc., under New York laws, with $10,000 capital; to manufacture motors. Corporators—Ernest W. Lawton, Theodore Young, Charles S. Lawton.

Elmira, N. Y.—International Resilio Co., under New York laws, with $50,000 capital; to manufacture tire fillers. Corporators—P. E. Lonagan, H. B. Collin, S. L. Welch, D. L. Thorpe, R. F. Nichols.

Fort Worth, Tex.—Cartercar Sales Agency of Texas, under Texas laws, with $10,000 capital; to deal in motor cars. Corporators—B. C. Rhome, Jr., Tom Frazier, W. B. King, O. W. Mathews.

Portland, Me.—Edwards Motor Car Co., under Maine laws, with $2,000,000 capital; to manufacture motor vehicles. Corporators—Clarence E. Eaton, T. L. Croteau, Albert F. Jones, B. M. Maxwell.

Gainsville, Fla.—Kelley Self-Starter Co., under Florida laws, with $200,000 capital; to manufacture motor starters. Corporators—W. R. Thomas, M. H. DePass, P. Miller, G. Hartwell Kelley and others.

Marion, Ind.—Railway Motor Car Co., under Indiana laws, with $200,000 capital; to manufacture motor cars. Corporators—W. O. Worth, J. D. Worth, Hiram Benhore, G. R. Stewart, Eben H. Wolcott.

Wilmington, Del.—Standard Auto Coach Burial Co., under Delaware laws, with$ 500,000 capital; to manufacture motor vehicles. Corporators—I. Neuberger, F. C. Cothran, S. Lewenstein, W. Litzenberg, C. H. Tebbetts.

New York, N. Y.—East End Garage Co., under New York laws, with $1,000 capital; to operate a garage. Corporators—Henry Krauss and Pauline Krauss, both of 24 Avenue D, and Max Steindler, 122 Columbia street.

Glenn Springs, S. C.—Smith Automobile Transfer Co., under South Carolina laws, with $700 capital; to operate an automobile 'bus line and delivery. Corporators—Clement F. Smith, Paul Simpson and others.

West Falls, N. Y.—Golden and Buffalo Auto Service Co., under New York laws, with $2,000 capital; to operate an automobile 'bus line. Corporators—Fred Hay and S. Hay, both of West Falls, and Conrad Leupold, of Buffalo.

New York, N. Y.—Russian Tyre Sales Co., under New York laws, with $30,000 capital; to deal in tires. Corporators—Otto Braunworth, 601 West 162d street; H. Ray Paige and Maud Steinway Paige, both of 340 West 107th street.

Brooklyn, N. Y.—Dunham Auto Co., under New York laws, with $15,000 capital; to deal in motor vehicles. Corporators—Frank Dunham, 296 Sterling Place; Louis Carmadella, 656 Union street; Charles A. Apfel, 6818 Tenth avenue.

New York, N. Y.—Canadian Overman Co., under New York laws, with $50,000 capital; to deal in tires, etc. Corporators—W. Albert Pease, Jr., 340 Madison avenue; Albert Z. Gray and Lusius Wilmerding, both of 5 Nassau street.

New York, N. Y.—Universal Auto Supply Co., under New York laws, with $10,000 capital; to deal in motor accessories. Corporators—George F. Connolley, 3505 Broadway; John J. Treacy, 3 West 63d street; John R. Hunt, 867 39th street.

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MEN WHO HAVE SHIFTED POSITIONS

Resignations and Promotions That Served to Place Many Workers in New Places —Few Leave the Trade.

W. H. Radford, designing engineer for the Warren Motor Car Co. of Detroit, has been promoted to the post of factory manager. W. H. Knowles succeeds him as head of the Warren engineering department.

H. W. Evans, who for the past two years has been connected with the Locomobile branch in San Francisco, has been placed in charge of the Locomobile's truck business on the Pacific Coast. He will remain attached to the San Francisco branch.

J. P. Griffin, formerly with the Merchant & Evans Co. of Philadelphia, has joined the sales staff of the Enterprise Metal Co. of Syracuse, N. Y., and will cover New York State. The company is well known to the trade because of its Vanadium bearing metal.

Charles E. Wertman, who previously had charge of the sales department of the Matheson Automobile Co. in Wilkes-Barre, Pa., has been promoted to the management of the Matheson branch, New York. He succeeds G. H. Duck, who recently joined the Alco staff.

L. D. Sullivan, previously connected with the Crocker-Wheeler Co. of Ampere, N. J., has assumed charge of the experimental department of the E. B. Van Wagner Co., of Syracuse, N. Y. The company just has completed an addition to its factory, which provides much more room than was previously available for experiments and tests of its die castings.

Ford Hawes, for ten years chief engineer of the Cadillac Motor Co. of Detroit, and a figure in the General Motors affairs, has joined the Flanders Mfg. Co. of Pontiac, Mich., in the capacity of detail engineer. He is the second of the General Motors staff to join the Flanders staff, C. A. McGee, controller of the General Motors Co., having preceded him.

M. A. Weissenburger, who for the past 18 months has covered the New England States and the territory adjacent to New York City for the Regal Motor Car Co., has been transferred to Regal service on the Pacific Coast. He will take over some of the duties performed by Bert S. Bingham, who recently resigned as the Regal's Pacific Coast manager.

George A. Crane has been appointed the manager of the Chicago Truck Department of the Locomobile Co. of America, with headquarters, of course, at the Chicago branch. Crane has been identified in the industry for some eight years, just having served with the Knox Automobile Co. for a considerable term and later with the United States Motor Co.

W. E. Moore, who since its inception has been superintendent of production for the Nyberg Automobile Works of Anderson, Ind., has been promoted to the post of assistant general manager. Otto Schultz succeeds him as superintendent. Schultz has had experience with the Mercer and National companies, but latterly has been engaged as superintendent of the Falls Motor Co., of Sheboygan Falls, Wis.

Joseph E. Warren, who successively served with the Chalmers and Everitt, has been appointed district manager for the Pacific Coast for the Abbott Motor Car Co., of Detroit. He will make his headquarters in San Francisco. E. D. Hand, formerly assistant sales manager for the E. R. Thomas Co., also has been appointed Abbott district manager. He will have charge of Ohio, Pennsylvania and West Virginia.

Burt S. Bingham, Pacific Coast sales manager for the Regal Motor Car Co. of Detroit, has resigned that office to become manager of the Fresno branch of the Pioneer Automobile Co. of San Francisco, which distributes Chalmers and R. C. H. gas cars and Flanders electrics in northern California. Bingham succeeds A. C. Wheelock, who has been transferred to the Pioneer headquarters in San Francisco.

May Illuminate Klaxon-Newtone Situation.

Although several somewhat similar suits have been instituted by the Lovell-McConnell Mrfg. Co., for infringement of its Klaxon horn patents, it is probable that the first decision that will shed a strong light on the troubled situation will be rendered by Justice Brown in the Federal court in Providence, R. I. The Lovell-McConnell Mfg. Co. has asked for an injunction restraining the Waite Auto Supply Co., of Providence, from handling the Klaxon horn because of its alleged violation of the Klaxon conditional license, which violation consisted of the sale of Newtone horns, the Klaxon license requiring that dealers shall not handle infringing articles. When the case came up before Justice Brown, it was argued at considerable length and several phases not heretofore discussed were gone into.

Death Claims Studebaker's Old Manager.

George E. Keller, at one time general sales manager for the Studebaker Corporation, and one of the truly loyal members of the Studebaker staff, died last week at his home in South Bend, Ind. He had been ill for a long time, his illness becoming so acute that last September he was obliged to relinquish active work. He was 43 years of age and is survived by a widow and three children.

Kansas Spring Wheel to Change Base.

The Durgin Auto-Wheel Co. of Lawrence, Kans., has accepted a proposal to remove to Hutchinson, in the same state. The plant employs 15 men and produces a spring wheel invented by F. H. Durgin.

MAY LEAD TO WAR OF TAXIMETER

Owner of Jones and Popp Patents Forces Issue—Sues Taxicab Operators and Rival "Leasing" Company.

What is the first of a series of similar suits designed to enforce the lease of the taximeters used on most of the taxicabs in New York City has been instituted in the Supreme Court for New York County by the American Taximeter Co. of New York, of which Francois Ducasse is president. It is directed against not only John Hefferon and John Kavanagh, who operate as the Circle Taxicab Co., but against the International Taxameter Co. of America.

According to the complaint in the case, Hefferon and Kavanagh signed a lease to use only the Jones taximeter which, like the Popp taximeter, is owned and controlled by the American Taximeter Co., the terms of the lease requiring a deposit of $30.00 and the payment of a monthly rental fee of $6.00 for each taximeter, Hefferon and Kavanagh agreeing not to use a taximeter of any other make during the life of the contract. Before it expired, however, it is alleged that they substituted instruments made by the International Taxameter Co. Hence the suit, which charges that the International Taxameter Co., although well aware that Hefferon and Kavanagh were bound by contract to exclusively use for a period of three years either the Jones or Popp meter, induced them to violate the contract and to execute another lease which is substantially a duplicate of that used by the American Taximeter Co. The latter, therefore, asks that an injunction be issued restraining Hefferon and Kavanagh from using the International meter and that the International Taxameter Co. be enjoined from leasing or selling any taximeter to the other parties to the defense, and that it be required to account for the profits made by reason of its transaction with Hefferon and Kavanagh. "Such damages as are ascertainable" also are prayed for.

The original contract involved was made in November, 1909, with the Jones Taximeter Co., which on April 1, 1910, was purchased by the American Taximeter Co., the purchase carrying with it all contracts and the patent on the Jones taximeter, No. 951,077, dated March 1, 1910. The International company has American rights to a patent owned by a German company, but is patenting a taximeter of its own.

Motz Establishes Two More Branches.

The Motz Tire & Rubber Co., of Akron, O., has opened branches in both Philadelphia and Cleveland. The Philadelphia branch is located at 1409 Race street, and is in charge of William M. Stubbs, while Charles Serfass has been made manager of the Cleveland branch, which is located at 2352 Euclid avenue.

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George Saindon has opened a garage in Zurich, Kan.

C. O. Stensend has opened a garage in San Diego, Cal.

Dr. W. P. Barnes has opened a garage in West Harwich, Mass.

Albin Bengston is erecting a garage on Main street, Luck, Wis.

Claude Huffman has opened a garage on Main street, Scranton, Ia.

The Everitt Motor Car Co. has opened in Tampa, Fla. Bruce Neff is manager.

Twisp, Wash., has a new garage; J. A. Eisley of that town is the proprietor.

Louis Schoetke and John Beemer are about to open a garage in Marengo, Ia.

J. G. Lawrence, of Wabash, Minn., is making ready to open a garage on Main street.

A. T. Schleismayer, of Long Beach, Cal., has opened a repair shop at 1108 Magnolia avenue.

A garage, 47 x 134 feet, is being built in Los Angeles, Cal., on Selma avenue, for E. L. Baker.

W. K. Van Wagoner, of Ida Grove, Ia., has remodeled his barn into a garage and automobile livery.

Under the style Dodge, Speiser & Porter a new Hupmobile agency has opened up in Durango, Cal.

F. L. Bristol, of Portsmouth, N. H., has opened a garage on C street, Hampton Beach, in the same state.

William Daniels, of Manistee, Mich., has leased the Airdrome in that city and will convert it into a garage.

Ray Neal, of Ashland, Ky., has entered the garage field; his place of business is at 17th and Market streets.

E. A. Nelson, an East Swazey (N. H.) mill owner, is erecting a garage near his present place of business.

J. W. Corkins, of Rockham, S. D., has purchased the Walter & Co. garage; he will continue the business.

William Steele and Walter McClellan have opened a garage in West, Tex. They will handle accessories, also.

F. B. Alexander, formerly of Little Rock, Ia., has engaged in the automobile trade in Sioux City, in the same state.

O. C. Lane is constructing a garage and machine shop in Burbank, Cal. The plans call for an expenditure of $10,000.

The McWilliams Auto Co., of Liberal, Kan., has filed a petition in bankruptcy. Assets are $1,500 and liabilities $2,000.

Jarold W. Sindell has sold the Dayton (O.) View Gymnasium to J. Glaser; the latter will transform it into a garage.

Charles C. Snodgrass, of Sisterville, W. Va., has purchased the Irwin Garage, in the Pennsylvania town of that name.

The Centralia (Wash.) Auto Garage Co. has been sold by the owners, Brunton Bros., to A. C. St. John, of Chehalis, Wash.

Rosco & Monteith is the style of a new garage firm in Ellendale, N. D. It is located at Second avenue and 3d street.

Work has been commenced on a garage on Newberry street, Newberry, Pa. It will be owned and operated by Funston Hill.

A garage, being erected at the rear of the Park Square Hotel, Springfield, Mass., by Samuel Squire, has been leased by R. D. Earle.

Harry Cohn, of Syracuse, N. Y., is about to erect a garage on McCarthy avenue; it will be two stories, 50 x 35 feet, and cost $5,500.

Joseph Ziegler, of Anderson, Ind., has accepted plans for a business block and garage to be erected at Meridian and 14th streets.

Andrea Steidel is about to erect a one-story brick garage, 42 x 102 feet, at 255 Bergen street, Newark, N. J. Its cost will be $7,000.

Under the style Auto Cleaning and Exchange Co., W. B. Hart and E. C. Shafer have opened a garage in West Lowe lane, Dayton, O.

Robert Doyle, of Nashua, N. H., has leased and will operate a garage at Old Orchard, Me.; it will be open only in the summer season.

The Cadillac Garage, in Fresno, Cal., which was recently destroyed by fire, is to be rebuilt immediately; the new structure will cost $11,000.

W. E. Burch, of Los Banos, Cal., is building a garage on 6th street; when completed it will be occupied by D. M. Rouse and J. W. Hulen.

Under the style Albert Lea Carriage & Automobile Works, Marinus Nielson and P. O. Nicolas have opened a garage in Albert Lea, Minn.

Robert Jensen has added his name to the list of garage operators in Whittier, Cal. His establishment is located at 309 West Philadelphia street.

Paul Utemark and Henry Wreidt, of Silver City, Ia., have formed a partnership and will erect a garage, 50 x 100 feet, in the central part of the town.

J. S. Moore, formerly of Chico, Cal., has removed to Red Bluffs, the same state, and will open a garage; he has secured the Ford agency for Tehama County.

Fred Van Sickle and W. J. Nichols are about to open an agency in Middletown, O. They will handle E-M-F, Studebaker, Flanders, Oakland and other cars.

Joseph Paquet has about completed a three-story garage at East 8th street and Hawthorne avenue, Portland, Ore. It represents an expenditure of $30,000.

John W. Williams has purchased the interest of A. W. Peterson in the firm of Chellin & Peterson, automobile dealers; the new style will be Chellin & Williams.

Madison, N. J., will soon be possessed of a new garage, 50 x 125 feet, located on King's road; Frederick W. Wilson, the owner, will expend $8,000 in its construction.

The garage in Fairbury, Neb., at 5th and F streets, operated by Berton Simmons, has been taken over by William Lewis; the men at one time were partners in the business.

A branch office of the Essenkay Co., of Chicago, tire filler manufacturers, is about to be opened at 715 Maiden lane, Fort Wayne, Ind. E. H. Kilbourne will be in charge.

Under the style McGinnis Auto Co., a Staver-Chicago agency has been opened in Lynn, Mass., at 65 Andrew street; the members are J. A. and J. B. McGinnis and E. L. Collins.

Morgan V. Disbrow is about to open a garage on Bridge avenue, Red Bank, N. J.

A garage has been opened in Bloomer, Wis., by Charles Keller, John Thornton and Peter Harring.

The Central Garage Co., of New Brunswick, N. J., has added to its business by leasing for five years the garage of W. J. McDede on Albany street; it will be conducted as a branch.

The Vollmer-Apgar Co., of Monroe, La., has purchased the stock and business of the Monroe Garage and Supply Co. The new concern will sell E-M-F, Flanders, Overland and other cars.

The White Bear Auto Co., of St. Paul, Minn., has absorbed the R. C. H. agency in that city; S. W. Wicks, manager of the R. C. H. agency, becomes sales manager for the White Bear company.

Cushing, Bros., of Campello, Mass., have secured permission to build a brick and concrete garage at East Chestnut and Montello streets; it will be 89 x 59 feet and will represent an expenditure of $10,000.

N. George Wahlberg and C. E. Johnston, formerly employes of the Thomas B. Jef-

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fery Co., of Kenosha, Wis., have secured an interest in the Purdy Garage, on Church street, in that city; they have left the Jeffery company to "take up for themselves."

C. T. Muller, M. J. Wittson and J. Schall have opened up at 55 Warburton avenue, Yonkers, N. Y., as the Terrace City Sporting and Auto Goods Co. Muller formerly was connected with the Shrive Garage in Yonkers.

The Iowa Auto & Supply Co., of Des Moines, Ia., has taken over the business of the Ryan Motor Car Co., the Chalmers dealer; the Iowa concern also handles the Locomobile, National, Marion and Woods Electric cars.

George J. Kohles, of Earling, Ia., and J. H. Deen, of Harlan, in the same state, have opened a garage in the latter town; they will, besides conducting a repair business, handle the E-M-F and Flanders cars and maintain a livery.

Karl Kaus, of Hampton, Ia., has sold his garage and some adjoining real estate to the Colby Motor Co., of Mason City, in the same state; the purchasing concern will tear down the present structure and build a garage, 64 x 110 feet, which it will use as a branch.

Samuel H. Rosenthal, of Chicago, has purchased of John E. Kernett and Clarence E. Beck property at 2436-38 Michigan avenue and will erect thereon a two-story service building at a cost of $40,000; the Hupmobile agency will occupy the structure when completed.

R. M. Weaver, general manager of the Columbus (O.) Machine Co., and W. J. Miller, superintendent, have resigned to purchase the Broad-Oak Automobile Co., in the same city; the latter concern has the Chalmers and Pierce-Arrow agencies. Miller was at one time connected with the Frayer-Miller Automobile Mfg. Co.

Walter J. Bemb, former central district sales manager for the Hudson Motor Car Co., and L. J. Robinson, former Southern district sales manager of the same company, have formed the Bemb-Robinson Co., to handle the Hudson line in Detroit, Mich. The new firm succeeds the J. H. Brady Co. as Detroit representative of the Hudson company and will occupy the Brady headquarters at 288 Jefferson avenue.

Recent Losses by Fire.

Bangor, Me.—S. L. Crosby Co., garage and forty cars destroyed. Loss, $15,000.

Scranton, Pa.—Robert Lance, Decker Court, garage destroyed. Loss, unknown.

Montgomery, Ala.—Alabama Auto Co., Court Bibb and Tallapoosa street, garage destroyed. Loss, $10,000.

Atlanta, Ga.—Atlanta Baggage and Cab Co., 44-46 Madison avenue, garage and thirteen taxicabs and others cars damaged. Loss, $20,000.

REORGANIZING THE LONDON OMNIBUS

Speyer Interests Make Public Their Plans —New Capitalization Exceeds $21,000,000 —How Old Stockholders Will Profit.

According to present indications, the already immense London General Omnibus Co., which operates a fleet of some 600 'buses in the streets and environs of London, England, is about to still further increase its activities, ambitious plans, which call for a material increase in capitalization, having been but recently proposed. The "shake up," which in all probability will result in the formation of a new company of the same name, was forecast a few months ago when the so-called Speyer group, which controls all the underground electric railways in the city, acquired control also of the London General Omnibus Co., the proceeding taking the form of the transfer of securities of the Underground Electric Co. in exchange for omnibus stock, the Speyers thereby obtaining 94 per cent. of the Omnibus company's capital.

Under the new scheme, the new London General Omnibus Co. will be capitalized at $6,250,000 in ordinary shares of $50 each. There also will be issued the following debenture stocks: $6,500,000 in 4½ per cent. first mortgage stock and $8,750,000 in 5 per cent. income stock, making the total capitalization $21,250,000. In addition to ordinary old stock outstanding to the amount of $6,000,480, the present company has the following prior charges: $1,955,400 in preferred stock, $1,500,000 in 4 per cent. debentures, $750,000 in 5 per cent. "B" debentures (repayable at 110), and $1,020,250 in 5 per cent. "C" debentures, the total being $11,226,130.

Under the scheme of reorganization which has been proposed, holders of preference shares and of various classes of debentures are offered to be paid off in cash or to be reinstated in the new company by being given holdings equivalent to those they relinquish. In either case, the option of either 4½ per cent. first mortgage stock or 5 per cent. cumulative income stock being given, the stock selected is to be taken at the price of issue to the public. Holders of ordinary stock will receive a cash dividend of 10 per cent., payable out of accumulated profits, and the stock will be purchased from the liquidator at the rate of $1,375 per $500 of stock.

Goodyear's New York Branch Expands.

After a long term of years on the corner of Broadway and 64th street, the Goodyear Tire & Rubber Co. of New York just has moved into more commodious quarters in its own building, on Broadway, between 66th and 67th streets, New York City. The building, which only recently was completed, is five stories in height and affords a total floor space of 20,000 square feet. Henceforth the headquarters of the New York company will be in the new building, affairs, as heretofore, being under the active management of J. B. Maus. On the two-acre plot of ground which the company recently purchased in Long Island City, opposite the Ford service building, announcement of the purchase having been made some three weeks ago in the Motor World, the company immediately will erect a six-story warehouse building which will provide close to 100,000 square feet of floor surface for storage purposes. It is expected that the warehouse will be ready for occupancy about January 1st, 1913.

American Underslung Rearranges Staff.

C. E. Perrin, who for the last three years has been assistant sales manager of the Regal Motor Car Co., Detroit, has resigned that position to become sales manager of the American Motors Co., of Indianapolis, makers of the Underslung American. Perrin will relieve D. S. Menasco, vice-president of the company, of immediate direction of the sales department, as henceforth Menasco will devote himself to field work and spend the greater part of his time in keeping in personal touch with American dealers. D. B. Williams, who formerly combined the duties of assistant sales manager and advertising manager for the American company, also will relinquish direct connection with the sales department and hereafter will devote himself wholly to the advertising and publicity work of the company.

Asch Gives Weed Judgment by Default.

Because Benjamin M. Asch of New York City, an accessory dealer, failed to enter an answer to an action brought against him by the Weed Chain Tire Grip Co., asking that he be restrained from handling the "Best" grip, an alleged infringement of the Parsons patent, No. 723,299, a decree pro confesso was entered against him last week and likely will be made permanent. The grip in question is of the "anchored" type and is manufactured by H. E. McLain & Co., of Natick, Mass.

Carter Bell Not to Make Motor Tires.

In spite of published reports that the Carter Bell Mfg. Co., of New York, had completed a factory in West Springfield, N. J., and purposed engaging in the manufacture of rubber tires for the automobile trade, M. E. Chidester, treasurer of the company, states that it has no intention whatsoever of manufacturing automobile tires of any sort. It is engaged in the manufacture of chemical products, not automobile tires.

Ford Secures Site in San Francisco.

After a considerable period of negotiations, the Ford Motor Co. of Detroit finally has secured the site for its San Francisco assembling or service plant. It has purchased the entire block bounded by Harrison, 21st and 22d streets and Treat avenue.

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THE MOTOR WORLD

PUBLISHED EVERY THURSDAY BY

The Motor World Publishing Company

1600 BROADWAY, NEW YORK, N. Y.

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Subscription, Per Annum (Postage Paid) $2.00
Single Copies (Postage Paid) . . . . . 10 Cents
Foreign and Canadian Subscriptions $3.00
Invariably in Advance.

Postage Stamps will be accepted in payment for subscriptions. Checks, Drafts and Money Orders should be made payable to The Motor World Publishing Co.

☞Change of advertisements is not guaranteed unless copy therefor is in hand on SATURDAY preceding the date of publication.

Contributions concerning any subject of automobile interest are invited and, if acceptable, will be paid for; or, if unavailable, will be returned provided they are accompanied by return postage.

Cable Address, "MOTORWORLD," NEW YORK.

Entered as second-class matter at the New York Post Office, November, 1900.

NEW YORK, JULY 11, 1912

ONE LAW THAT DESERVES A WELCOME.

On Tuesday next, the ordinance prohibiting the use of the muffler cut-out in New York City becomes effective. Whether it proves effective remains to be seen. Noting the pleasant anticipations of New Yorkers, a Detroit paper has served warning that it were well not to pitch hopes too high, for in Detroit a similar law is regarded as a joke and is more honored in the breach than in the observance.

In certain parts of New York, however, it is fair to predict that the law will be enforced, if not by the police, then by the sufferers themselves. For wherever there is located a garage or a grade, even though it be but one-half of one per cent, the suffering of the residents has been long, if not always patient. With a weapon within their reach, they are not likely to remain content to suffer a continuance of the aggravating nuisance due to the use of the muffler cut-out. There is no street noise which is more unnecessary or more irritating or more indefensible.

The too numerous man who finds it necessary to "increase his power" or to "cool his engine" by opening his muffler on the slightest incline, or who performs the same operation to "check the firing of his engine," or employs the cut-out in lieu of the horn for signaling purposes, or the man who frankly admits "he likes the noise"—all of them are common nuisances and should be treated accordingly. There are times and places for all things and the public street is no place for "cooling engines" and "testing" them in such fashion or otherwise making the motor car appear a nuisance which it is not.

Practically all explanations offered for the use of the cut-out are excuses, not explanations. It is to be hoped that when the prohibitary law becomes effective the courts of New York City will attach their real value to such explanations. The law is one that should be heartily welcomed by all considerate and right-thinking persons.

EXPLAINING THE PRICE OF GASOLENE.

In Great Britain, as in America, the soaring of the price of gasolene has set the automobile interests by the ears. There, as here, they have listened to stories concerning supply and demand and they have gone so far as to hold a meeting of protest, which, however, availed them nothing. The head of the British gasolene industry was present at the meeting and he was overfull of kind words and other pleasant conversation, worthy even of Standard Oil's own publicity bureau. Having made his gracious speech, the oil magnate returned to his stockholders and a few days later addressed to them another and a different speech. He congratulated them on the alleged fact that the price of gasolene had at last become "normal;" he said that too long it had been sold at unreasonably low prices and the inexorable law of supply and demand having at last exerted its effect, it was a great pleasure to announce the declaration of an extra dividend of 10 per cent and to prophesy that the financial returns for the year would constitute a record in the history of the company, which has been in the habit of declaring 20 per cent dividends annually, which is about the proportion of Standard Oil dividends.

It is not often that such speeches become public property, but when they do become public, nothing better serves to show, as too often is the case, that not supply and demand, but desire for dividends and "record years," is at the bottom of too many price advances. When 20 per cent dividends are possible on huge capitalizations, talk of supply and demand having affected the market from which such generously proportioned dividends spring is nine-tenths buncombe.

OIL DRIPPINGS AND WHAT THEY SIGNIFY.

Considerable discussion was indulged in at one time as to whether the oil and grease dropped by motor cars upon asphalt roadways was injurious to the asphalt; apparently this was decided in the negative, as the discussion has ceased while the dripping of oil continues.

But whether or not oil injures asphalt, there is no question that the loss of lubricants is injurious either to the cars or to the pockets of the owners. All the oil that escapes must be replaced, and some cars find it possible to lose a very considerable quantity of oil, as can be seen by a glance at the places where motor cars most do congregate. Moreover, where oil can escape, dirt and grit can work in—and it does so, to the detriment of the bearing surfaces involved.

The only way to prevent the escape of oil is to make all joints so snug that there is no likelihood of leakage. It is the duty of the manufacturer to see that the joints are properly made in the first place, and it is the business of the owner to see that they are kept in that condition. Catching oil in a pan and throwing it away through a drain plug is a half-way measure that serves only to cover up imperfect design or workmanship.

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"DEVEROE" PROVES A GAY DECEIVER

Willingness to Work and Talk of "Factory Sales Manager" Enables Him to Victimize St. Louis—His Clever Scheme.

As plentiful as have been the methods of swindling that have been practiced on persons connected with the automobile industry, or attempted, it has remained for an enterprising individual who poses under the name "Deveroe" and who so far as can be learned has confined his operations to St. Louis, to evolve a brand new scheme which for plausibility and genuine art in consummation rarely has been surpassed. In addition to being a plausible talker, "Deveroe" —"Jay" is the first name under which he chooses to be known — appears to be a clever actor. It was the combination of these two qualities, and a penchant for real work, even if for short periods, and a certain facility in the use of shop tools that allayed suspicion and permitted him to carry on his nefarious trade to the annoyance and monetary cost of at least one well-known St. Louis sales agency.

Reduced to simple terms, "Deveroe's" modus operandi was delightfully simple. On Saturday, June 22d, he introduced himself at the St. Louis salesroom as a "road service man" from one of the New England automobile factories. In accounting for his appearance he explained that the factory sales manager had left him in Indianapolis with instructions to meet him in St. Louis. He relied upon his "knowledge" of his sales manager's movements to forestall any demand for credentials, and, to revert to the vernacular, he "got away with it."

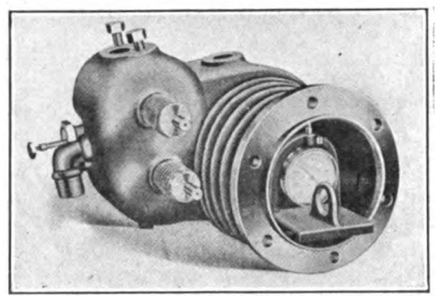
He became a zealous mechanic and apparently had the training to work upon cars after the manner of real road corps men. For three days he put in his time industriously, but on Monday he appeared to be worried over the non-appearance of his sales manager and produced what purported to be a telegram from him stating that he had been delayed and would not reach St. Louis until the following Thursday, but instructing "Deveroe" to remain in St. Louis until he arrived. Soon other things commenced to bother him. He claimed he had not received his expense check and induced the St. Louis bookkeeper to cash a personal check for $35. He also felt that he should send some money home, and in view of the fact that he had "about $150 coming to him for salary and expenses, which the sales manager would O. K.," he presented a check the following day for $50.

Both checks were drawn on a bank in the city in which "Deveroe" claimed the factory which employed him is located, an illustration of his resourcefulness in making lies appear authentic. Telegraphic communication, however, brought word that the checks were fraudulent, but before this information reached St. Louis the "road service man" had taken the quickest road out of town.

Warning was wired to other companies and dealers, urging them to be on the lookout in case "Deveroe" attempted to resume business elsewhere. It has been impossible to identify "Deveroe" from a description, but it is believed that he is a man who was dismissed from some factory or that he has been employed elsewhere in a capacity permitting him to make a close study of persons and methods in its sales organization.

Cylinder Gauge of Great Accuracy.

By way of alleviating the troubles of "final inspectors" and materially increasing efficiency and the quality of workmanship, there recently has been perfected in England by George H. Alexander, of Doe street, Birmingham, a new type of cylinder gauge, which, it is claimed, will permit of the accurate gauging of cylinders to within one-quarter thousandth part of a millimeter. Though the gauge has been developed primarily for determining the accuracy of cylinder bores, its use, it is pointed out, is not confined to this purpose. The gauge may be used also for discovering inaccuracies in straight milled or planed surfaces, the method of application for such uses being apparent in the accompanying illustration, which shows the gauge in use in a cylinder casting.



ALEXANDER'S CYLINDER GAUGE

Because the gauge is controlled by a spring, the tension of which remains practically constant for long periods, and no dependence is placed upon the operator's sense of touch, as is the case with other methods of testing, it is claimed that the gauge is the most accurate instrument of the kind extant. In using the device, it is recommended that a standard ring of the absolute size of the finished cylinder bore be used in setting the dial, after which it is merely necessary to slip the gauge into the cylinders, inaccuracies showing plainly by the movement of the dial hand. As the dial may be graduated either to .001 mm. or .01 mm., the exact amount that any portion of the bore is "out" may be determined easily and correction in the grinding process made to overcome the inaccuracy. The gauge is regularly supplied in two sizes, the size illustrated being applicable to cylinders larger than 3½ inches bore by the use of points of different lengths. A smaller gauge for three-inch cylinders is the alternate size, though it is recommended that wherever possible the larger size be used, as it permits of the greater accuracy.



July 9-29, Indianapolis, Ind.—Annual Four States tour of the Indiana Automobile Manufacturers' Association.

July 13, Forestville, N. Y.—Hill climb under the auspices of the Forestville Motor Club.

July 15-16, Cleveland, Ohio—Reliability run under the auspices of the Cleveland News.

July 15-20, Milwaukee, Wis.—Reliability tour, under the auspices of the Wisconsin State Automobile Association.

July 21, St. Louis, Mo.—Track races under the auspices of the Universal Exposition Co.

July 22-28, Dallas, Texas—Farm and Ranch Tour under the auspices of the Dallas Automobile Club.

August 8-10, Galveston, Tex.—Beach races under the auspices of the Galveston Automobile Club.

September 2-3, Indianapolis, Ind.—Races on the Motor Speedway, promoted by the Indianapolis Motor Speedway Co.

September 7, Hadine, Minn.—Track races promoted by the Minnesota State Fair Association.

September 17, Milwaukee, Wis.—Grand Prize road race under the auspices of the Milwaukee Automobile Dealers' Association.

September 21, Milwaukee, Wis.—Vanderbilt Cup race on the Greenfield course, under the auspices of the Milwaukee Automobile Dealers' Association.

Three Judgments for Failure to Pay.

Because it neglected to meet obligations, two judgments were recorded this week in the New York County Clerk's office against the City Motor Car Co., of New Rochelle, N. Y., one for $300.75 being credited to the Swinehart Tire & Rubber Co. and the other, for $88.12, to the Endurance Tire & Rubber Co., both of New York City. One by F. Ray and others, trading as Smith-Haines, automobile supply dealers at 1761 Broadway, against the Central Tire Supply Co., of New York City, for $37.38.

U. S. Tire Breaks Ground in Boston.

Ground has been broken at the junction of Commonwealth avenue and Beacon street for an imposing five-story structure which, when completed, will be occupied by the Boston branch of the United States Tire Co. It will be ready for occupancy about January 1st next.

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FINE SPORT ON OLD ORCHARD SANDS

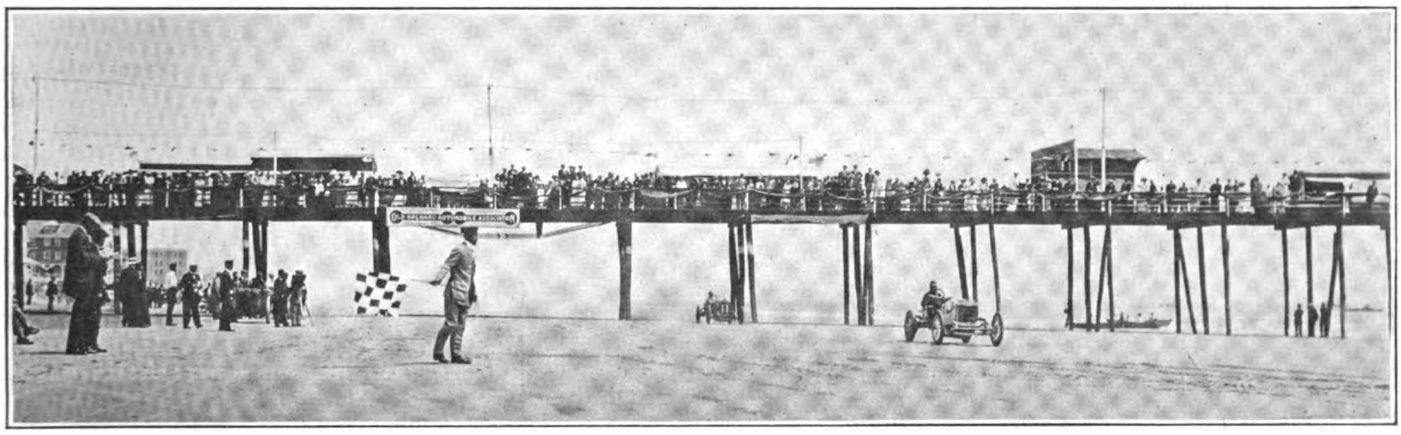
But Scarcity of Spectators Chills Promoters —Honors Well Distributed—One Hundred-Mile Races the Feature Events.

Three days of fine weather and fine racing did not serve to make the Old Orchard speed carnival an undiluted success. Despite the weather and the racing, on two of the three days the crowd refused to attend; on the other day, July 4th, the crowd was big enough and interested enough to warm the cockels of the hearts of members of the Old Orchard Automobile Association, but the empty grandstand and the general absence of spectators on the 5th and 6th were sufficient to chill the heartstrings and marrow of the promoters. It was their second attempt, and unless they are possessed of unwonted courage and financial support, they are not likely to repeat the carnival another year.

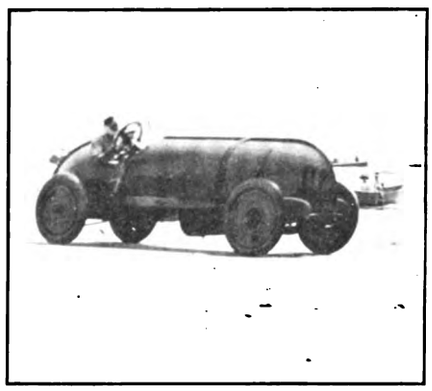
Old Orchard, which probably is so called because there are no orchards within easy sight, forms part of the serrated coast line of Maine. It is more or less of a summer resort, which implies that it is possessed of a beach, but until last year the beach was not sung in automobile stories. It bears small resemblance to the famous strand of Florida on which automobile records of a cyclonic nature were set up, and the wonder is that it rendered possible such speed as was created during the three days of last week. This time it was real speed, too. For as those who have even fairly retentive memories will recall, they knocked automobile records sky high and galley west when the automobile carnival was inaugurated last year—that is, the records appeared to have been dispersed in the several directions until it was discovered that the Old Orchard course was a mere matter of two miles short in every five. They surveyed the course for last week's contest, however, and as electrical timing also prevailed, the figures probably will pass without dispute of any kind.

The course was two and a half miles out and home, a circuit of five miles, the turn being made around a barrel; and it was there that the sand flew in all directions, for the surface of the beach was neither so hard nor so smooth as might be; but despite the fact, some fast work was accomplished. No part of the record table was upset, but a full line of Old Orchard Beach records were set up to the great glory of Old Orchard and the Maine coast generally.

During the three days 18 events were decided, the most notable of which were the 100 mile races, one of which was scheduled for each afternoon. The one on the first day exemplified the fact that time and tide wait for no man, not even automobile racing men, for before more than three-quarters of the century had been traversed by the leader, Dave Lewis in a Stutz, the domain of Father Neptune had so far encroached upon the erstwhile race course that a halt was necessary. The race went for only 75 miles, Lewis's time for the distance being 1:17:48¾, while the time of Harry Grant (Berkshire) and Neil Whalen, who piloted a National, both of whom completed 65 miles before the course turned "wet," was 1:21:06 and 1:21:12, respectively. On the second day, however, due primarily to the expedition with which the rest of the program was carried out, the century grind was finished long before the rising tide covered the course, and finished, too, at a better than a mile-a-minute pace by William Endicott, who drove his Schacht over the finishing tape in 1:36:41. The real glory of the contest, however, belongs to Jack Rutherford, who finished in his National just nine seconds later than the winner, for it was he who had been pacemaker throughout 99¼ miles of the grind, and it was due to the breaking of a connecting rod as he was approaching the finish that he "lost out." He skipped across the line on three cylinders, however, finishing well over three minutes ahead of his team mate, Whalen, who took third position. The 100-mile race which was run on Saturday proved a "hurrah" for David Lewis, who drove his Stutz over the prescribed distance in 1:32:43⅘, very nearly four minutes better than the time made by Endicott on the day previous.



CLOSEST FINISH OF THE MEET—NIKRENT (CASE) BEATING JOHN DE PALMA (MERCER) IN 10-MILE EVENT ON JULY 4



DISBROW AND THE "JAY-EYE-SEE"

Endicott, who took second honors, beat his time of the day previous by 32 seconds, crossing the tape over 14 minutes ahead of Harry Cobe, the Jackson driver, who finished third.

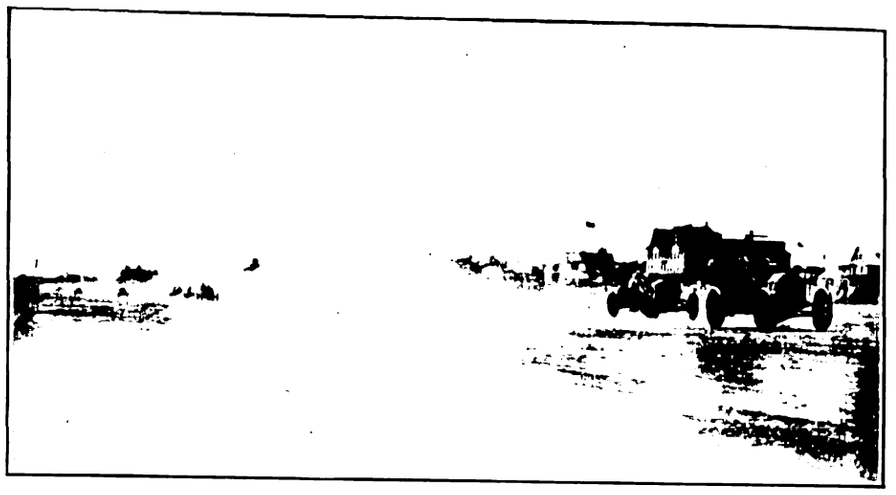
The best time of the carnival was made on the first day, when Louis Disbrow drove the reconstructed racing car "Jay-Eye-See" for a mile in 35⅕ seconds, at a rate of 102.3 miles an hour. Disbrow also took a ten-mile Class E event which was run on the first day, driving a Simplex across the tape in 8:36¾, nearly 14 seconds better than the time made by Joe Matron in the Fiat, who finished second. Two Class C events, for cars of 231-300 and 301-450 inches and which went for ten and for five miles, respectively, were taken by Joe Nikrent (Case) in 10:28⅗, and Harry Grant, who piloted the Berkshire, in 4:25¾, in the order named.

The honors of the second day were well divided. Disbrow took a five-mile free-for-all, again driving the Simplex, his time for the distance being 4:39 1/10; Dave Lewis (Stutz) finished 9-10 of a second later. Albert Hummel, who took turns driving a Mercer with John De Palma, a "debutante" brother of Ralph, cleaned up a Class E event for cars with displacements under 301 inches and which went for fifty miles. Hummel's time was 54:10½. William Burke drove his E-M-F entry to victory in a Class E event for cars with displacements under 301 inches and finished in 5:49. A Class C

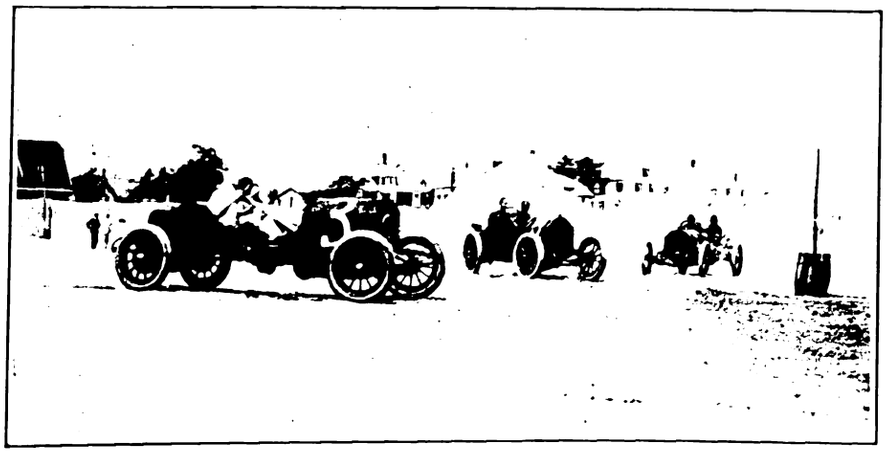
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event for cars with displacements of 301-450 inches, which went for five miles and was won by Jack Rutherford in the National, completed Friday's program.

Disbrow made two individual time trials on the last day of the carnival, driving the Jay-Eye-See, but neither in the five-mile trial, which was run in 4:04½, nor in the single mile, which he completed in :39 1/10, were the records endangered. Driving the Simplex, he also captured a ten-mile free-for-all in 8:53. Basle, in the Bianchi car, was second, his time being 9:32 1/10. A Class E event which was run in two sections, for cars with displacements of 161-230 and 231-300 inches, and which went for 25 miles, proved a hollow victory for William Burke (E-M-F), who ran in the smaller car division and completed the course in 27:10⅘. The division for the larger cars, however, was more hotly contested, and was won in 25:29 1/10 by Joe Nikrent in the Case. Nikrent also won the Class C event for cars with displacements of 231-300 inches, completing the ten miles in 9:54.



MATSON (FIAT) LEADING WHALEN (NATIONAL) IN FIRST 100-MILE EVENT



AT CLOSE QUARTERS ROUNDING THE BARREL

John De Palma (Mercer) finished five seconds later. The summary:

Thursday, July 4th.

One mile, time trials—Won by Louis Disbrow (Jay-Eye-See), time :35⅕; second, Jack Rutherford (National), time :47.

Ten miles, for cars with displacements of 231-300 inches—Won by Joe Nikrent (Case), time 10:28⅗; second, Alfred Hummel (Mercer), time 10:30¾.

Five miles, for cars with displacements of 301-450 inches—Won by Harry Grant (Berkshire), time 4:25 8-10; second, Dave Lewis (Stutz), time 4:42 1-10.

Ten miles, for cars with displacements under 600 inches—Won by Louis Disbrow (Simplex), time 8:36¾; second, Joe Matson (Fiat), time 8:50 1-10.

100 miles, Class E, run in three divisions, for cars of 301-450, 451-600 and over 600 inches—Called when Dave Lewis (Stutz) had completed 75 miles, time 1:17:48¾; Harry Grant (Berkshire), 65 miles, time 1:21:06; Neil Whalen (National), 65 miles, time 1:21:12.

Friday, July 5th.

Five miles, free-for-all—Won by Louis Disbrow (Simplex), time 4:39 1-10; second, Dave Lewis (Stutz), time 4:40; third, Joe Matson (Fiat), time 4:42; fourth, Neil Whalen (National), time 4:50.

Fifty miles, cars with displacements under 301 inches—Won by Albert Hummel (Mercer), time 54:10½; second, Joe Nikrent (Case), time 55:45; third, Plimpton (S. P. O.), time 67:10¾.

Five miles, for cars with displacements under 301 inches—Won by William Burke (E-M-F), time 5:49½; second, John De Palma (Mercer), time 5:57 1-10; third, Plimpton (S. P. O.), time 6:16½.

Five miles, for cars with displacements of 301-450 inches—Won by Jack Rutherford (National), time 4:32 3-10; second, Dave Lewis (Stutz), time 4:43 1-10; third, Neil Whalen (National), time 4:47 1-10; fourth, William Endicott (Schacht), time 5:02½.

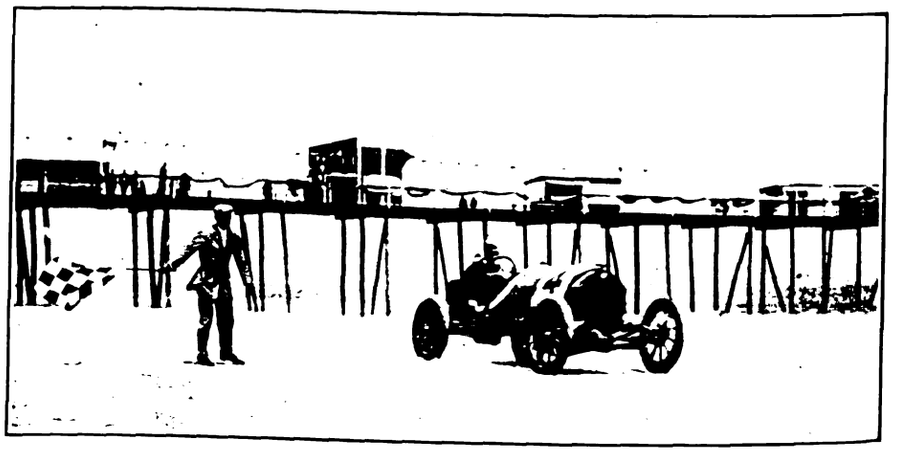
100 miles, for cars with displacements of over 301 inches—Won by William Endicott (Schacht), time 1:36:41; second, Jack Rutherford (National), time 1:36:50 1-10; third, Neil Whalen (National), time 1:39:65 1-10.

Saturday, July 6th.

Ten miles, for cars with displacements of 231-300 inches—Won by Joe Nikrent (Case), time 9:54; second, John De Palma (Mercer), time, 9:59 3-10; third, Esleek (Lexington), time 12:13.

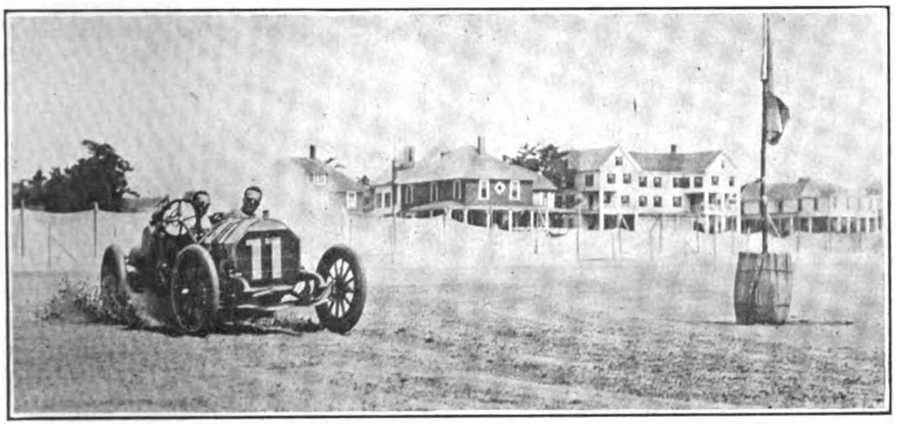
25 miles, Class E, run in two divisions, for cars of 161-230 and 231-300 inches. First division—Won by William Burke (E-M-F), time 27:10⅘. Second division—Won by Joe Nikrent (Case), time 25:29 1-10; second, Albert Hummel (Mercer), time 25:37 1-10.

Ten miles, free-for-all—Won by Louis Disbrow (Simplex), time 8:53; second,



LEWIS (STUTZ) WINNING THIRD DAY'S 100-MILE RACE

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HUMMEL (MERCER) MAKING THE SAND FLY IN HIS 50-MILE RACE

Basle (Bianchi), time 9:32 1-10; third, Neil Whalen (National), time 9:40 1-10; fourth, John De Palma (Mercer), time 10:22.

100 miles, for cars with displacements of under 600 inches—Won by Dave Lewis (Stutz), time 1:32:43⅗; second, William Endicott (Schacht), time 1:36:09; third, Harry Cobe (Jackson), time 1:50:11½.

Five miles, time trial—Louis Disbrow (Simplex). Time, 4:04½.

One mile, time trial—Louis Disbrow (Jay-Eye-See). Time, :30 1-10.

Four States Tour Leaves Hoosier City.

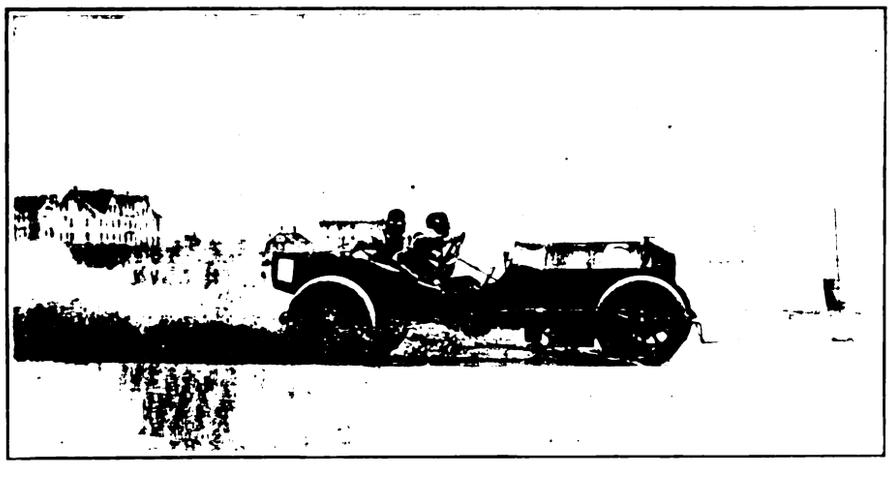
Laden, metaphorically speaking, to the brim with a live load of factory representatives, including both members of the advertising force and selling force, as well as mechanical experts, and each fortified with literature and otherwise prepared to exploit the combined advantages of motor cars built in the Hoosier State and the special advantages of the particular Indiana built car which he represents, 26 pleasure cars and two motor trucks left Indianapolis on Tuesday last, 9th inst., on the first leg of the Four States tour.

The tour, which is an annual event with the Indiana Automobile Manufacturers' Association, is a "boost Indiana" affair and is run with the avowed purpose of advertising Indiana in general and Indiana automobiles in particular. The contest side is eliminated altogether; the speed, which is determined by a pacemaker, who is chosen by drawing lots, will rarely, if ever, exceed the legal speed limit. Twenty days will be spent in traveling the 1,200-mile course blazed by the Great Western pathfinder car, which is doing duty as a confetti car, and which leads through Indiana, Ohio, West Virginia and Kentucky.

The automobiles which started in the tour are as follows: American (3), Pathfinder (2), Marion (2), Nyberg (4), Premier (2), McFarlan (2), Haynes (2), Maxwell (2), and 1 each Marmon, Cole, Great Western and De Tamble cars; also two trucks, a Whitesides and a Service.

Indianapolis Prize Money for "Also Rans."

What to do with the $2,100 which constituted the sum total which was to be awarded to the drivers who finished in eleventh and twelfth position in the 500-mile Sweepstakes run on the Indianapolis Speedway on Memorial Day, is a question over which the management of the speedway has been pondering ever since Ralph Mulford drove his Knox across the tape in tenth position at the close of the event. It was at first suggested that the sum be split and offered as a consolation prize to Ralph De Palma and Bob Burman, both of whom had contributed greatly to the interest which attached to the event, but on second consideration it was not deemed advisable to discriminate against the other twelve drivers who had dropped out through no wish of their own. It finally was decided to divide the prize money between the fourteen who did not finish, according to the number of laps he completed, and on this scale each man receives $1.9213 for each lap. De Palma and Burman, who completed 199 and 157 laps, respectively, will receive $382.54 and $301.54. The other drivers will receive sums in proportion. Knight and Ormsby, both of whom dropped out in the seventh lap, will receive the smallest amounts, $13.46 each.



ENDICOTT (SCHACHT) PLOWS DEEP AT TURNING POINT

Elgin Road Races Are Abandoned.

The life-line with which the Chicago Motor Club and the Elgin Road Race Association attempted to save the day by changing the annual Elgin road races from stock events, which they always have been, to non-stock events, has failed of its purpose, and the races, which were scheduled for August 23 and 24, have been definitely abandoned for this year, and in all probably for all time. Even under the new conditions, the entry blanks failed to "draw," and as only 10 drivers actually had "signed up," the Chicago Motor Club voted to divorce itself from the venture. Inasmuch as the Elgin Road Race Association, through Fred. Jencks, its representative, also has signified its intention of leaving the contests severely alone, the project is virtually dead. Though at one time it was rumored that an individual, whose name was not divulged, had purchased all the rights and privileges and would stage the contests without the aid of either of the organizations which in the past have managed them jointly, the story was promptly denied by Jencks, and there is scarcely even a remote possibility that anything of the kind will come to pass, though it is hoped to stage the events next year.

New York Enacts "Night Hawk" Law.

After it had lain on the shelf for several months, the New York Board of Aldermen, on Tuesday last, 9th inst., took up and passed the ordinance framed with a view of keeping closer "tabs" on "night-hawking" chauffeurs. The new ordinance will make the tracing of a delinquent chauffeur a simple matter for the police department, which has access to the books at all times. The ordinance in part provides:

"It shall be the duty of each and every keeper of a public garage to record in a book kept solely for such purposes, the time of departure from such garage of all motor vehicles kept for hire, giving the names and addresses of the owner and the driver thereof, the name and class of the vehicle, the license number of the driver and the vehicle, and the time of return to the garage of each such vehicle shall be entered in such book, and such reference book shall be open to inspection at all times to the representatives of the Public Departments and the Mayor's office."

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FAST FLIGHTS ON WILDWOOD STREET

Freitag Does the Straightaway Mile in 43⅗ Seconds—Bauer Takes Two of Three Open Events.

Over a mile road, straight as an arrow, and innocent of both dust and bad spots, which leads through the very heart of North Wildwood, N. J., six speed events which comprised the Fourth of July program offered by the North Wildwood Automobile Club were contested on Thursday last. Fast flights naturally were to be expected under conditions which were nothing if not ideal, and the most pessimistic spectator was not greatly disappointed, for in at least two of the events the proverbial "mile a minute" mark was far surpassed, while "going some" was the rule of the day.

The honors of the day, although pretty well divided, went in greatest measure to Edward Bauer, who drove a Buick car and won both the free-for-all handicap, which was run in heats—Bauer's time for the first and final heats being 1:19 and 1:15, respectively—and a Class C event for cars with piston displacements of 160-230 cubic inches, in which he completed the mile in 1:19⅕. The best time of the day was made by Freitag, who drove the mile in a Fiat in 43⅗ seconds, or at the rate of 83.4 miles an hour. Freitag's time was made in the individual time trials and was a full three seconds better than the time of Streach, who drove his Chadwick down the straightaway in :46⅗. A match race between Harvey Ringler, in a Mercer, and C. C. Fairman, who piloted the Kline entry, resulted in a victory for the former, who covered the distance in 1:08 as against 1:29 by Fairman. A similar race between Irwin, who drove a Marion, and Earle, who drove an American, was won by Irwin, whose time, 1:08, was nine seconds better than that of the American pilot. John Menker finished first in the Class C event for cars with piston displacements between 301-450 cubic inches. Menker's time, :53, was the best time of the day made in competition. The summary:

One mile, for cars with displacement of 161-230 inches—Won by Edward Bauer (Buick), time 1:15⅗; second, M. Baker (Carter), time 1:16⅘; third, R. S. Smith, Jr. (Empire), time 1:19⅕.

One mile, match race—Won by Harvey Ringler (Mercer), time 1:08; second, C. C. Fairman (Kline), time 1:29.

One mile, for cars with displacements of 301-450 inches—Won by Menker (Kline); second, Knox (National); third, Thebaude (G. J. G.). Time, :53.

One mile, time trials—Freitag (Fiat), :43⅗; Menker (Kline), :46⅗; Streach (Chadwick), :50; Davis (Apperson), :53⅕; Knox (National), :56⅕; Woods (Benz), 1:00⅗; Irwin (Marion), 1.04⅗.

One mile, free-for-all handicap—Won by Bauer (Buick), 1:19; second, Baker (Carter), 1:19⅘; third, Smith (Empire), 1:21⅗. Second heat—Won by Ringler (Mercer), 1:06⅘; second, Irwin (Marion), 1:12⅕; third, Woods (Benz), 1:19⅕. Third heat—Won by Davis (Apperson), 1:06⅕; second, Freitag (Fiat), 1:06⅘; third, Thebaude (G. J. G.), 1:07. Final heat—Won by Bauer (Buick), 1:15; second, Davis (Apperson), 1:15⅗; third, Ringler (Mercer), 1:16⅗.

One mile, match race—Won by Irwin (Marion), 1:08; second, Earle (American), 1:17.

Effect of Garages on Adjacent Realty.

What effect, if any, the establishment of a garage has on adjacent realty is a problem which now is confronting the civic authorities in St. Louis, Mo., where the almost simultaneous application by seventeen individuals and concerns for permission to erect this type of structure has brought forth protests in certain parts of the city, and the question is one which gives promise of affording subject for considerable cogitation and discussion. Apart from the garages which wish to locate in the segregated sections, known as "automobile row," there are a number which wish to invade the residential and business parts of the city. The city fathers are unwilling to hamper business progress, and still do not care to make any unwise move. One clergyman opposes the placing of a garage opposite his church for obvious reasons, another citizen claims the establishments will reduce the value of near-by property and several complaining petitioners express great fear of the automobile shops, declaring that almost always they are fire traps and a menace to the neghborhood.

Automobile Horn as a Burglar Alarm.

Unusual and effective use for electric horns of the Klaxon type is suggested by a Chicago man who houses his car in a private garage not a great distance removed from his residence. The Chicagoan had been troubled by burglars, who, despite lock and bolt, had entered the garage and relieved the machine of such fixings as readily could be turned into money. After the third visit of the marauders, the sufferer had the garage wired and all the appurtenances of a closed-circuit burglar alarm system were installed save the gong, which was supplanted by the electric horn. When the thieves paid their fourth call such a volume of noise issued when the garage door was forced that the entire neighborhood was awakened, and the policeman on beat caught both intruders. The garage has not been entered since.

Hibner Heads Iowa Falls Club.

Charles G. Hibner has been elected president of the Iowa Falls (Ia.) Automobile Club. Other officers of the organization who were chosen at the annual election are: Vice-president, W. V. Shipley; secretary-treasurer, Dr. W. G. Morton.

BIG MONEY FOR MILWAUKEE EVENTS

Purse of $10,000 Offered in Grand Prize and $6,000 in Vanderbilt Cup Races—How It Is Distributed.

Perhaps the Grand Prize race will prove a mere "curtain raiser" for the Vanderbilt Cup race, as the promoters design shall be the case, but if it so proves it will not be that it lacks the glitter of gold; for from the dollars and cents standpoint the imitation of the French race is more attractive than the truly American classic.

The value of the money prizes which will go to the leaders in the Vanderbilt race, which will be run on September 21, amounts to $6,000, distributed as follows: $3,000, together with the possession of the Vanderbilt cup for one year and a donor's permanent trophy, to the winner; $2,000 to the second man, $1,000 to the third and $500 to the fourth. The race will go for 296.65 miles, which represents 34 circuits of the 8.725-mile course, and will be run as a Class E event, open to cars of Class C with piston displacements of 301-600 inches.

The money prizes which attach to the Grand Prize race amount to $10,000 in value, $5,000 of which goes to the winner, together with the trophy; $2,500 to the second man, $1,250 to third, $750 to fourth and $500 to fifth. The race will also be run over the Greenfield course at Milwaukee, the date being September 17. The rules simply require that the car carry two passengers; that a reverse gear be provided; the exhaust be not directed toward the ground; that the width of the car be not over 6 feet 2 inches.

For the newly inaugurated Pabst trophy, which will be open for Class C cars with piston displacements of 231-300 inches and which will go for 25 laps, or 218.12 miles, on Friday, September 20, and for the other, the Wisconsin trophy, which will be open for cars of Class C with piston displaceemnts of 161-231 inches and will cover 175.5 miles (20 laps) on the same day, the prizes naturally are not so large. The Pabst trophy is offered under a deed of gift similar to that under which the Vanderbilt is contested for, and carries with it a cash prize of $2,000 for the winner, $500 for second man, $250 for third and $125 for fourth. The Wisconsin trophy becomes the permanent property of the winner, who also receives $1,000, second $500, third $250, fourth, $125.

Milwaukee is preparing to accommodate a bumper crowd. Thirty-five thousand reserved seats are to be placed in the huge grand stand on the course, and there also will be staked off reserved parking spaces adjoining and in the vicinity of the grand stand, and 30,000 unreserved parking spaces. The sale of tickets for boxes, grand stand seats and reserved parking spaces will begin next Monday, July 15th. It is stated that already there are 1,000 reservations.

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TETZLAFF WINS TWICE AT TACOMA

Evans, Poltun and Cooper Account for the Other Road Events—Flying Stones Cause Two Unusual Mishaps.

That well beaten trails across prairie sod can, when properly treated and thoroughly "manicured," supply a setting for a speed carnival which is surpassed by but few well paved road courses, amply was demonstrated during the two day speed carnival which was held on July 5 and 6 at Tacoma, Wash., in connection with the Montamaro Festo Carnival. The speed of the newly created course was proven when Ralph Mulford covered a single lap, which represents five miles, in 3:55, or at a rate of 84.5 miles an hour.

The events which were run on Friday and Saturday were the first of real importance the Great Northwest ever had witnessed, which, coupled with the fact that the races were but part of the program offered for the seven day "Feast of the Mountain" Carnival, made the attendance of a heart-cheering number of interested spectators a foregone conclusion. The course, which after many trials and tribulations was laid out within a stone's throw of the city, was just .033 of a mile short of being five miles in length. Although negotiations had been opened to secure the public roads some two months ago, complications arose which brought operations to a halt, and it was not until the last two weeks that the steam rollers could prepare the surface and the contractors' gangs ease off the corners to eliminate "hairpin" bends in the dirt highways.

If the contenders were not numerous, they did not lack class, and of the number Teddy Tetzlaff, the Fiat pilot, gave the best account of himself. He won both the 200-mile Class E event, which was run off Friday and in which his time was 2:54:31, and the 250-mile free-for-all, which was the only event staged on Saturday and in which his time of 3:47:00.45 was slightly better than 66.6 miles an hour. Tetzlaff's time in the shorter event, however, was better, and stands at 68.9 miles an hour.

The most interesting of the four events which were on the first day's program was the 200-mile event for cars with displacements under 600 inches, in which five entrants—Ralph Mulford (Knox), "Hughie" Hughes (Mercer), Teddy Tetzlaff (Fiat), Earl Devore (National) and Earle Cooper (Stutz)—all famous in varying degrees, started. Devore held the front until 18 of the 40 laps had been reeled off, when Mulford nosed his Knox into the premier position. It was on the seventh lap that Mulford had circled the course in 3:55, and it is not at all unlikely that he would have sooner gone to the fore had he not been delayed when his car skidded into a ditch on the 16th lap, and later he suffered a more unusual mishap. He held his position until a stone thrown up by Hughes's Mercer, which was about to pass, struck him on the head and temporarily blinded him. Tetzlaff, who had held his Fiat in second position, then assumed the lead and finished in 2:54:31. Mulford's mechanician, Chandler, had taken the wheel of the Knox when the stone struck the Knox pilot, and he drove it in good style into second place. Third place went to Earle Devore in the National. Hughes ran the Mercer into a fenee on the 39th round, but both he and his mechanician escaped injury.

The "baby" race, Class E, for cars with displacements under 231 inches, which went for 100 miles, proved "easy" for Evans, who drove one of the two "Flanders Special" cars which were entered, the same machines which participated in the Santa Monica road race last May and over which quite a rumpus was raised in A. A. A. circles. Evans's time for the 20 laps was 1:38:20. Towers, who also drove a Flanders Special, followed his team mate, leaving third position to Zoermann (Maxwell). Thus the order of things which was followed at Santa Monica was reversed in the Tacoma road race.

Poltun, who drove one of the three Mercer cars entered in the Class C event for cars with displacements of 231-300 inches, won a hollow victory when he brought his machine across the tape after having covered the 150 miles in 2:25:13. Both of his team mates, Bergdoll and Hughes, were eliminated by motor trouble, while Sebastian, who drove the Cole entry and was the only other contender, dropped out when the car caught fire, after having gone 12 of the 30 laps.

The medium car event, 150 miles for cars with displacements of 301-450 inches, went to Earle Cooper, who covered the distance in his Stutz in 2:15 flat. Second honors went to Devore in the National, while Rossi in the Pope-Hartford, who was the only other contender, finished last.

The single 250-mile free-for-all event which was run on the second day of the meet naturally proved the most interesting of the five which were offered by the Festo committee. It started with eight contenders, Tetzlaff and Verback driving Fiat cars, Hughes in a Mercer, Mulford in a Knox, Devore who piloted a National, Bergdoll, Cooper and Sebastian who respectively drove a Benz, Stutz and Cole. Verbeck finished in fourth position, while Earle Cooper drive his Stutz fifth over the tape.

Tetzlaff assumed first place as early as the 19th lap of the 50-lap affair and never was passed, although Bergdoll in a Benz, who took second place and finished in 3:50:49.85, over 13 minutes later than the winner, at times did look dangerous. Devore took third place, his time, which was made in the National, being 3:52:28.9. The other five contenders, including Mulford, who had sufficiently recovered from the injuries received the day previous, were strung out along the course.

The only accident of a really serious nature which occurred, and which in all probability will prove fatal to a spectator who had assumed a post of vantage in the limbs of a neighboring tree, was occasioned by a flying stone which struck the spectator and caused him to release his hold. He was seriously, if not fatally, injured by the drop which naturally followed. The summary:

Friday, July 5th.

100 miles, for cars with displacements under 231 inches—Won by Evans (Flanders Special), time 1:38:20; second, Tower (Flanders Special), time 1:39:04.35; third, Zoermann (Maxwell), time 1:42:19.5.

150 miles, for cars with displacements of 231-300 inches—Won by Poltun (Mercer). Time, 2:25:13.

200 miles, for cars with displacements of under 600 inches—Won by Tetzlaff (Fiat); second, Mulford (Knox); third, Devore (National). Time, 2:54:31.

150 miles, for cars with displacements of 301-450 inches—Won by Cooper (Stutz); second, Devore (National); third, Rossi (Pope-Hartford). Time, 2:15:00.

Saturday, July 6th.

250 miles, free-for-all—Won by Tetzlaff (Fiat), time 3:47:00.45; second, Bergdoll (Benz), time 3:50:49.85; third, Devore (National), time 3:52:28.9.

Oldfield Makes Records for Montana.

It was Barney Oldfield from A to Z at the four-event racemeet which was run at Butte, Mont., on Thursday, July 4th, in conjunction with a number of foot races, motorcycle races and an aviation meet. It marked his return to the track and to record making. Of the four races, Barney took the three in which he started, though in two of them he was only driving against time to establish new State records for both a single and for five miles, which for years was his "specialty." Oldfield drove a Christie car in his attempt to shatter the mile record, but the best he could do was 57 seconds flat, breaking the record by one-fifth of a second. He also drove a Cino five miles, his time being 5:07, which also is claimed to be a Montana record. Oldfield later steered the Cino in a ten mile match race with Lew Heineman, who piloted a Benz, and completed the distance in 10:44½, beating the Benz driver by half a second. The event in which Oldfield did not compete was a ten-mile owners' race, which was won by Arthur Hayes in a Pope-Hartford, who completed the distance in 11:11⅕. Second place went to Herbert Riley in a Ford, while J. Hayes took third position in a Chalmers.

At a meeting which resulted in the formation of the Flatonia (Tex.) Automobile Club, E. A. Ernin was elected president. The other officers are: Vice-president, F. W. Dusek; secretary, D. McKay; treasurer, F. F. Wotpkia.

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"INDIGNATION" MARS MOROSS MEET

Peculiar Attitude of Iowa Boatmen Causes Crowd to Shrink Unprofitably—Burman, as Usual, Plays Star Part.

Indignation greeted the arrival in Davenport, Ia., of the troupe of professional racing drivers under the management of E. A. Moross on Thursday last, July 4th, where the racing men were scheduled to deliver themselves of a five-event race meet on the mile track. The indignation was the outcome of the belief on the part of the management of the annual power boat regatta, which also was billed to take place on the afternoon of the holiday, that Moross was an interloper and had come to Davenport to "cut in" on the crowd that might be attracted to the slower-going boat races. So high did the peculiar feeling run that the spectators at the track were few, most of them coming from outside of the city.

As is usual with Moross programs, the greater part of the interest attached to the three heats which were run for the Remy Brassard and trophy, two of which, the second and final, were won by Robert Burman in the Blitzen Benz, his time being 3:00⅗ and 3:05 for the respective heats. The first heat went to the Benz driver, E. A. McDonald, who completed the three miles in 3:07.9, after both Burman and Menenghetti, who piloted his Mercedes, had dropped out following a collision, which, however, was not of a serious nature.

Burman drove the Benz one mile in 52⅘ seconds, as against 59⅗ made in an Ohio by John Raimey. The other two events, for cars with displacements over 450 and under 600 inches, both of which went for five miles, proved easy for Raimey, who respectively defeated Bishop (White) and Burman (Cutting), finishing in 5:10⅘. The summary:

Five miles, for cars with displacements of under 450 inches—Won by John Raimey (Ohio); second, Burman (American). Time, 5:44⅕.

Three miles, for Remy Brassard and trophy. First heat—Won by E. A. McDonald (Benz). Time, 3:07.9. Second heat—Won by Robert Burman (Benz); second, Louis Menenghetti (Mercedes); third, E. A. McDonald (Benz). Time, 3:00⅗. Final heat—Won by Robert Burman (Benz); second, Louis Menenghetti (Mercedes); third, E. A. McDonald (Benz). Time, 3:05.

One mile, time trials—Robert Burman (Benz), time :52⅘; John Raimey (Ohio), time :59⅖.

Five miles, for cars with displacements of under 600 inches—Won by John Raimey (Ohio); second, Robert Burman (Cutting). Time, 5:10⅘.

Special Speed for State Fair Week.

While the volume of traffic in various thoroughfares is oftentimes the basis of fixing a speed limit for vehicles, Hutchinson, Kan., has gone the custom one better and, having passed a speed ordinance covering other local conditions, has declared that while the Kansas State Fair is on in that town the motorists will be governed by a special speed limit which, for Main street, is eight miles an hour. The new ordinance clips five miles an hour off the former limitation and places the figure at ten miles an hour on all streets, in contrast to the former rule of ten miles on Main street and fifteen on side streets.

Plaint of the Fire Engine Driver.

"Things ain't what they used to be," remarked the driver of one of the big horse-drawn steam fire engines of the New York Fire Department, apropos of fire-fighting apparatus and automobiles generally. "It used to be that when we went along a street, hittin' it up to beat the band, pretty near everything in front of us would make for the side streets or squeeze up agin' the curbs to let us go by, an' pretty near everything behind us would be left almost out o' sight. Nowadays when we get behind a bunch of automobiles they just open up a little an' leave us behind, feelin' like we was anchored, an' many a time I've seen a loaded motor truck come up on us from behind an' slow down to keep from buttin' into the back end of the ingine. This automobile business sure has changed things a lot, an 'it's just about time for the fire department to do some changin', too. Horses used to be all right, but now—well, the sooner they go the better."

Dawson to Become Vaudeville Star.

Having obtained fame sufficient to make his name well known throughout the United States, Joe Dawson, winner of the Indianapolis Speedway Sweepstakes, May 30, has followed in the lead of numerous other celebrities and is going on the stage—at least, according to an announcement sent out. E. C. Shuart, who managed the Speedway events, will be manager of the venture. Dawson's, or rather Shuart's, scheme is to appear at various fairs in exhibition drives and in theaters, where he will appear at the wheel of the winning National car, while another part of the exhibit will be a lecture and a half-mile of moving picture film.

Can a Car be Exempt in Bankruptcy?

Whether an automobile may be a tool or an instrument of trade and thus come within the exempt property class in a bankruptcy proceeding is a point which now is puzzling Judge Munger in Lincoln, Neb., and which also is causing some worry for Arthur W. Dorland of Bennett, Neb., because the latter is making a strenuous fight to keep his car, while his creditors are equally determined that it is not a tool and therefore should be used to swell the creditors' fund. Dorland is an implement dealer, and in traveling about the country repairing machinery used his car.

BURMAN AND RAIMEY PLAY SEESAW

Take Turns in Cleaning Up at Fort Wayne's Meet Promoted by Moross—Burman Retains Remy Brassard.

Although the scent of victory was strong in the nostrils of Louis Menenghetti throughout the better part of the three miles over which he drove his Mercedes in the first heat for the Remy Brassard and trophy on Sunday last, July 7th, at Fort Wayne, Ind., it was but the sense and not the substance which the West Indian partook of, for his sole competitor, Robert Burman, nosed him out on the home stretch and poked his Benz over the tape just five feet ahead of Menenghetti. Burman's time for the three miles was 2:52½. The Cuban did not have a chance in the second heat, for motor trouble easily put him out of the running. Burman, however, finished in 2:54½. Since by taking the first two heats, Burman clinched his hold on the "meal ticket," the third heat was eliminated.

Of the other five events which were incorporated in the program offered by E. A. Moross all save one—three miles, for cars with displacements under 450 inches, which was won by John Raimey (Ohio) in 3:20—went the way of the Remy Brassard heats. Burman not only established a new track record for a mile, which he drove in 53¼ seconds (old record 53½, held by Oldfield), but he also "cleaned up" a Class E event which went for five miles and which he completed in 5:12, and a three mile event, for cars with displacements of under 600 inches, which he won in 3:21, driving against Raimey in an Ohio and a local man, Kyle, who piloted a White. Burman used the Cutting in both of these events. In the time trials for a single mile, which completed the program, Burman, driving the Benz, covered the distance in 54½ seconds as against 57 made by Menenghetti. The summary:

Three miles, for cars with displacements of under 450 inches—Won by John Raimey (Ohio); second, Kyle (White). Time, 3:20.

Five miles, for cars with displacements of under 600 inches—Won by Robert Burman (Cuttng); second, John Raimey (Ohio); third, Kyle (White). Time, 5:12.

One mile, time trial—Robert Burdan (Benz). Time, :53¼.

Three miles, for Remy Brassard and trophy. First heat—Won by Robert Burman (Benz); second, Louis Menenghetti (Mercedes). Time, 2:52½. Second heat—Won by Robert Burman (Benz); second, Louis Menenghetti (Mercedes). Time, 2:54½.

Three miles, for cars with displalements under 600 indhes—Won by Robert Burman (Cutting); second, John Raimey (Ohio); third, Kyle (White). Time, 3:21.

One mile, time trials—Won by Robert Burman (Benz), time :54½; second, Louis Menenghetti (Mercedes, time :57.

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ECONOMICAL OPERATION VS. EXCESSIVE POWER

Engineer Cameron Takes Up Cudgels in Favor of Small Motors Running at Economical Speeds and Transmitting Power Through Four-Speed Gearsets—Argues That Big Motors Waste Fuel Most of the Time, and Explains Why—Points to Four-Speed Gear as Next Popular Improvement.

That, as has more than once been pointed out by engineers both in America and abroad, there is logic in increasing slightly the final gear ratio between the engine and the road wheels, particularly in the lighter-powered pleasure vehicles which steadily are increasing in numbers, has again been advocated, though not all of such advocates are as unqualified in their opinions as is W. H. Cameron, who for a number of years has been chief engineer to the Willys-Overland Co. and who at present occupies a similar position with the Michigan Buggy Co. Cameron favors particularly the adoption of the four forward speed change gear mechanism—or transmission, as that portion of a car somewhat erroneously has come to be styled—for motor cars in general, and specifically for the small-powered car, which at present, he says, cannot operate efficiently with less than four forward speeds.

The analogy between the four-speed change gear mechanism and slightly increased final gear ratios between the engine and the road wheels should be perfectly apparent without the necessity for lengthy explanations, though in view of the importance of the subject it is not irrelevant briefly to summarize the connection between the two. With the present style of three-speed change gear mechanism, it is absolutely essential that the final gear be such—3½ to 1 is general, though even 4 to 1 is fairly common—that it may be used almost constantly, up hill and down dale. That is to say, the operator must be able to negotiate every hill except the steepest without recourse to second speed, inasmuch as second speed is so low as to cause an excessive strain on engine parts, due to high engine speed, and an excessively high fuel and oil bill for the same reason.

Therefore, it follows that if the final gear is low enough to permit its being used practically constantly, without change for ordinary hills, there must be a great amount of distance covered when the gear is too low for either engine efficiency or economy of fuel. Under such conditions for a car speed of, say, 30 miles an hour, the engine really is running at a greater speed than is good for it as a steady diet. Short periods of high engine speed are not detrimental, of course, for nearly every engine is designed for just such contingencies. But no ordinary touring car engine is designed for continual use at very high speed. Moderate engine speed is conducive to longevity and, all things considered, it is the change gear mechanism that controls, directly, the speed of the engine.

With the four-speed change gear mechanism, on the other hand, it is possible slightly to increase the final gear ratio between the engine and the road wheels, for the reason that the third speed—which is higher than the second, though not quite as high as the third speed in a three-speed gearset—then may be used for ordinary, and in many cases for extraordinary, hills, while the direct drive is used for slight inclines and for level running. The combined effect, of course, is apparent: The engine operates at slower speed on level roads or slight inclines when high gear is used, and it also operates at slower speed on steeper hills when third speed must be used; and the car speed in any case may be a little greater (if necessary) without the necessity for racing the engine at excessive speeds. Despite the advantages of slightly increased final gear ratios, however, it is not possible to obtain them unless a four-speed change gear mechanism is used, and it is not unlikely, therefore, that Cameron's prognostication to the effect that before long all good cars will be so equipped will be realized.

"It may sound strange," he says, "when I make the prediction that the next radical change in automobile engineering will be the general adoption of the four forward speed transmission. By that I mean that in my opinion the four-speed transmission is bound to become generally used in all good American cars. To-day it is found in this country only in the highest priced cars. You can count on the fingers of one hand the cars selling under $3,000 that now have four speeds forward. Abroad, where special reasons have forced the use of the four-speed transmission in the large majority of cars, its advantages are better understood.

"One reason for its use on foreign cars is the extremely small bore of cylinders, due to the fact that the tax is graded by the size of the bore. An American car of more than 4-inch bore has little demand in England, where a bore of 3 inches and a fraction is generally used with an extremely long stroke, to give the maximum horsepower. Under such conditions the four-speed transmission is positively essential, both to economize the power and to gain the required flexibility of control. Its use under these conditions, however, only serves to illustrate the actual money saving in fuel and the lessened strain upon the machine, as well as the advantages in driving which will come with the widespread adoption of the four-speed gear box in America. For the same engineering principles apply in our case as in theirs.

"Before passing the point of economy, let me say I believe that the tendency in America will be decidedly toward smaller bores. This is due to the fact that everybody knows gasolene is becoming scarcer, and is sure to mount in price. I think the small bore is coming, even with the effort to popularize the six-cylinder car. The popular six-cylinder car of the future will be one with about the same piston displacement as the standard fours of the present.

"The four-speed gear box has been confined to high priced cars in America, primarily because of its prohibitive cost. Engineers, and I may say manufacturers, almost unanimously admit the great advantage of four speeds over three, but the cost question has caused the delay, until the demand of car buyers has become imperative. It means a complete change of design—more gears, wider gear centers—a big expense for the improvement, when all are totaled. But the advantages to be gained from it are certainly so manifest, so great, that it is a question of months only when it will be generally accepted. And with our roads, the four-speed transmission comes to general practice none too soon.

"Motorists now generally realize that the life of a car depends upon its use and abuse. It does not take a car owner long to reason to the fact that making a car put forth every ounce of power on frequent grades is highly detrimental. 'Learn to control your car exclusively by the gas, as far as possible,' says the instructor in motoring to the student. The salesman in ninety-nine cases out of a hundred says the same thing to the beginner who has purchased his car. Everybody who gives advice on running a car says it, thereby admitting that something is wrong or is lacking in the transmission. Yet everybody realizes on a moment's reflection that the transmission is the logical first means for the control of the speed. It takes long experience and special aptitude—I may say genius—for driving to know just how far to throttle in regulating a car by gas. Few ever learn it perfectly. The driver who does it with any degree of skill knows his car like a human friend and brother, and is also guided by some sixth sense of intuition.

"With the great majority this dependence almost entirely on the gas for regulating

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the car is a matter of guesswork. It is disastrous not only to the pocketbook but, in not a few cases, to human life. It costs money to pull the engine speed down until the car almost quits on high, and then race the engine to pick up on second, as is so commonly practiced. We have grown used to the sight of the driver on high gear killing his motor at street crossings, street car tracks and railroad tracks by throttling down before he is successful in getting his clutch out.

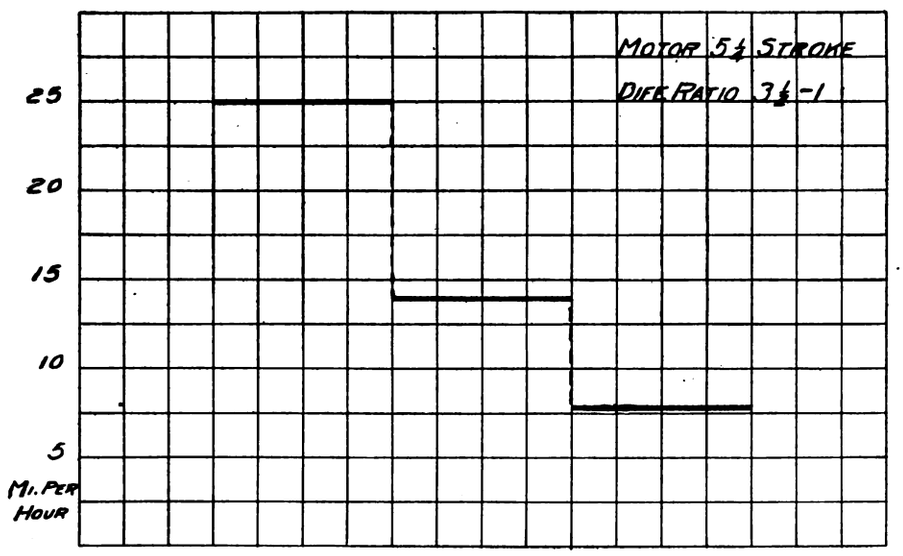


FIG. 1—SHOWING "GAP" IN ORDINARY THREE-SPEED TRANSMISSION

"If instead he slips into third speed on a proper four-speed transmission, he has a gear ratio which is practically the same as a 4½ to 1 rear axle, having which, as one knows, permits the car easily to be throttled down to two or three miles an hour, and still pick up quickly. By this time it should not be necessary to explain that the basic purpose of four-speed transmission is not to satisfy a mania for more speed. This was a common error when the four-speed transmission was rare practice.

"The four-speed transmission provides an efficient, feasible and logical control of the car—a control not based on guesswork, but upon an accurate, proved and dependable gear box, built in accordance with universally acknowledged mechanical principles, and in accordance with the best engineering practice the world over. It provides this control without wasting the fuel—without racing the motor, and consequently with far less vibration. It relieves the motor of undue strain, especially in taking heavy grades. With four speeds (the direct drive being on the fourth) the long sand stretches, the heavy roads, the miles of axle-deep slush, the hills and mountains may be negotiated without fear of punishing the motor, in the way that now works havoc, and shortens by years the life of the best car built.

"Grade climbing is one of the problems most satisfactorily solved by the four-speed gear box. Every motorist knows that unless he has an engine on which he can depend for a practically unlimited pull, he will find the inclination of many grades just a trifle too much for his top-speed. On such a grade with a four-speed gear box he can drop to third speed and it takes his car up like a bird. With a three-speed gear, he has to drop from top speed to second—and he makes an awful drop—in fact, second speed is almost 50 per cent. lower than high.

"The same condition is encountered in many roads which are just a little too heavy for top speed, although the car is actually capable of much better speed on these roads. We shall understand the necessity of the four-speed transmission more perfectly if we say that, while the speed ratios of a proper four-speed car are 1, 2, 3, 4 (the fourth being the top speed), the speed ratios of a three-speed car are really 1, 2, 4—the gap between second and high speed being so great that there is really no third speed. So when we put in a four-speed gear box we actually are adding a third speed to the car.

"The greatest question in four-speed transmission is the ratios of the gearing, or the number of times the motor must turn over to the number of revolutions of the rear wheels. The subject has engaged the attention of the leading engineers in Europe and America for several years; but it is only lately that they have practically agreed as to the direct drive.

"There are two types of four-speed transmissions: One direct on third speed, the other direct on fourth. The latter is generally conceded to be greatly in advance of the former. This is overwhelmingly proved by the practice on the great majority of cars now using the fourspeed gear box. Of 157 four-speed foreign cars, 132 have the direct drive on fourth. Of the American cars now using four speeds, 75 per cent. have the direct drive on the fourth. In fact, as the four-speed gear box gains in favor the indirect fourth will drop out overnight.

Table No. 1.

Speed.	Ratios Transmission.	Ratios Engine to wheels.
3	1.00–1	3.50
2	1.80–1	6.30
1	3.20–1	11.20
R	3.88–1	13.58

Table No. 2.

Speed.	Ratios Transmission.	Ratios Engine to wheels.
4	0.86–1	3.01
3	1.00–1	3.50
2	1.76–1	6.16
1	3.40–1	11.90
R	4.60–1	16.10

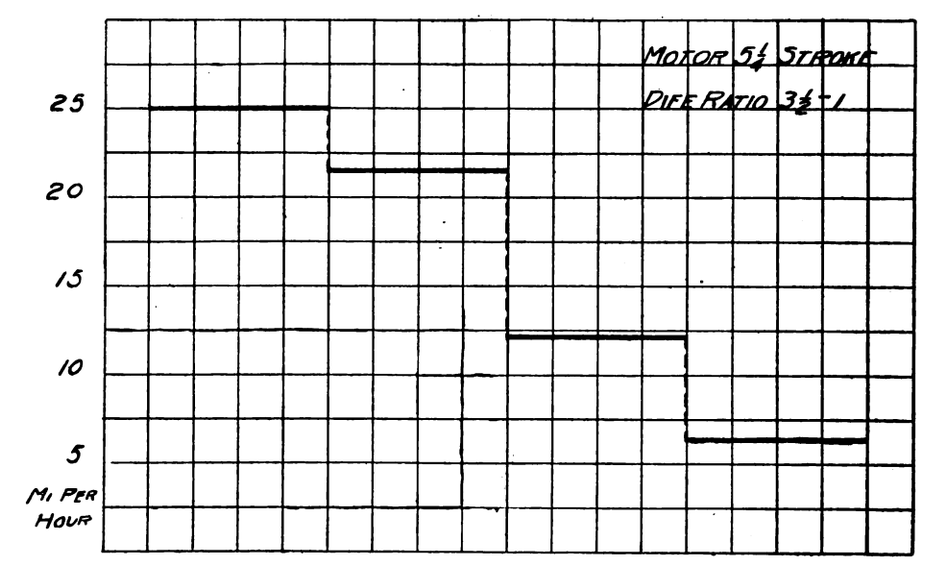


FIG. 2—FOUR-SPEED TRANSMISSION WITH INDIRECT FOURTH

Table No. 3.

Speed.	Ratios Transmission.	Ratios Engine to wheels.
4	1.00–1	3.50
3	1.29–1	4.51
2	2.10–1	7.35
1	3.76–1	13.16
R	4.57–1	15.99

"A study of the accompanying tables and diagrams will show the difference at a glance. Table No. 1 shows a common three-

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speed transmission which is about what is fitted to 85 per cent. of the threespeed cars. It will be noted that 3½ rear axle gear ratio is used in all three tables. It will be noted also that in this transmission the first or low speed is only 11.20 to 1. This is the reason that so many cars are forced to back over the stiffer grades if there is no other way round. The reverse, of course, is lower. This is the result of transmission design.

"Take the next table now, which is No. 2. It shows a transmission of a well known and popular car. This is for the motorist who thinks he wants to burn up the roads, and who buys a car with an indirect fourth. He overlooks the fact that he loses almost all that he thinks he gains, through the inefficiency of the gears, and has two speeds which are almost alike. He has not much better second and low than his friend with the three-speed.

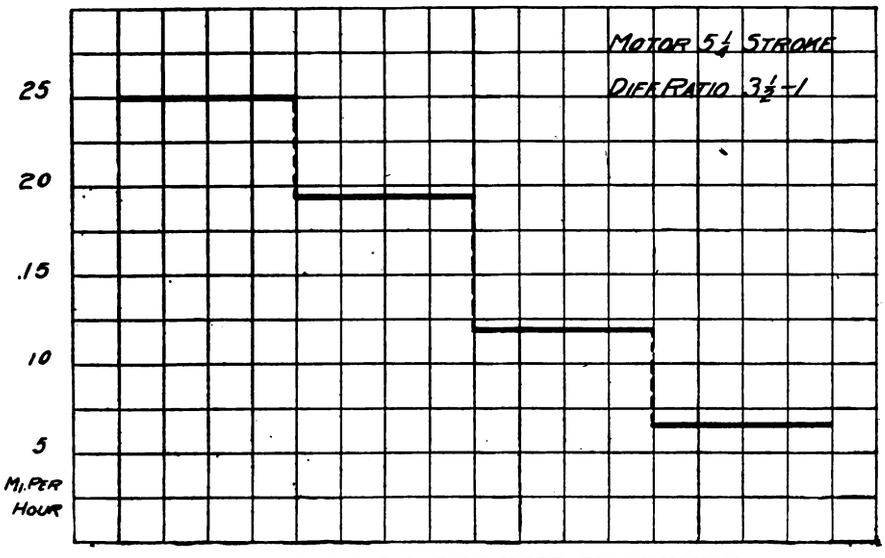


FIG. 3—CAMERON'S IDEAL FOUR-SPEED TRANSMISSION

"The ideal transmission, in my opinion, is shown in table No. 3. It will be seen than, when it is necessary to change from fourth to third, a speed is obtained which enables the car to go over the hill at a fairly good rate. Also note that the second in this is almost between the first and second of the others, consequently if the car is fitted with a good clutch, the operation for all ordinary driving resolves itself down to a three-speed job (as the second can be used for starting on the level), leaving the extremely low first and reverse for emergency.

"Taking all these facts (and the showing of the tables and diagrams herewith) into intelligent consideration, everyone must realize that four speeds, with the direct drive on the fourth, is the immediate step in the evolution of the leading cars.

Mysterious leaks in the high-tension part of an ignition system often can be detected by running the motor in the dark, when the escaping current will illuminate its own pathway.

DAIMLER ADDS THREE-TON TRUCK

Newest Product of Noted British Manufacturer Has Silent Chain Transmission and Worm Drive—Other Features.

Having obtained an enviable reputation and the King's patronage for its poppet valve engine pleasure cars, both of which have continued since the adoption of the Knight sleeve valve engine for all its products, the Daimler Motor Co. of Coventry, England, which was the first company to exploit the Knight engine, has, within the past few months, formally entered upon the production of commercial vehicles for road work and also for agricultural purposes.

At present the complete line of commercial vehicles includes five chassis varying in capacity from one to five tons and two agricultural tractors of 36 and 100 horsepower, respectively, the latest addition to the line being a three-ton capacity Knight engine chassis which is suitable for either omnibus work or inanimate freight transportation, and which numbers among its unusual features a chain change speed mechanism, worm drive and leather universal joints. Another of the unusual features of the chassis is that it is equipped with semi-elliptic springs in the rear and three-quarter elliptic springs in front. The upper quarter member of the front springs, however, is at the rear end of the springs. In general, the engine differs but little from the other Knight engines which are manufactured by the Daimler company, the cylinders being cast separately and having a bore and stroke of 110 m.m. and 150 m.m., respectively. The whole construction, however, is rugged, as becomes a product which is expected to withstand severe strains.

As an indication of the thoughtfulness of the designing engineers in providing against contingencies over which they have no control, the magneto is completely enclosed in a water and dust tight aluminum casing. The drive from the engine is transmitted to the propeller shaft through the intermediary of a "silent" chain change speed mechanism similar to that which is used in the fleet of 'buses operated by the London General Omnibus Co. Three speeds forward are provided, with direct drive on high, and the reverse motion is obtained by means of orthodox pattern spur gears. The clutch is of the leather-faced cone variety, and is no less than 21½ inches in diameter. The final drive is by overhead worm to live axles, nothing of a startling nature being included in this portion of the car, with the exception that beneath the axle housing, with which they are formed integral, there are conveniently located "feet" or jack rests, their purpose being to eliminate the chance of injury to the axle casing by an ill placed jack.

Making Old Piston Rings Serviceable.

In case piston rings show very poor bearing surfaces and it is not possible to obtain new rings, an improvement often can be made by easing the high spots of the rings with a very fine file, which must be new and sharp in order to get through the almost glassy "skin" formed by friction with the cylinder walls. The rings can be tried in the cylinder by slipping them into the bore while they are removed from the piston. It is rather a difficult job to do, and no very fine results can be expected; but by careful work it is possible to very considerably reduce compression losses, avoid unequal cylinder wall wear and increase the available power of the motor. The finishing touches should be put on with a piece of very fine emery or crocus cloth on a flat piece of wood, and the greatest care should be taken to clean off every trace of the abrasive powder from the rings before allowing them to touch the cylinder walls. Incidentally, if the rings are in such condition that they have not the springiness necessary to press them against the cylinder walls, no amount of surfacing will do them any good, and while peining the inner circumferences would perhaps help some, the operation is almost certain to result in the breaking of the brittle cast iron.

Driving Acid Out of Storage Batteries.

In equalizing the electrolyte in the different cells of a storage battery, it should be borne in mind that the acid must be in the cells somewhere, even though the hydrometer reading does not show it, unless some of the liquid has been spilled and the cells filled up with water. As the acid is not in the electrolyte, it must be in the plates, and this being the case, it remains to drive it out of the plates by long, slow overcharging, which will gradually bring up the readings of the "low" cells. The fact that the liquid has evaporated, necessitating the filling of the cells with water, means nothing, for the water evaporates, leaving the acid behind.

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SPEAKS UP FOR THREE-CYLINDER

Foreign Advocate Thinks it was Abandoned too Soon—Its Several Advantages as he Sees Them.

"Should the three-cylinder engine be revived?" asks a writer in a foreign periodical. Logically, there seems no real reason why it should be revived, particularly in view of the notable advance in the number of six-cylinder engines that has been made and is being made every day, though, if the question is examined from every point of view, it appears, parodoxically enough, that it might be revived to some purpose, after all. Of course, there is quite a number of three-cylinder two-cycle motors on the market that are giving excellent service, but there are no four-cycle three-cylinder motors regularly used in cars to-day and it is many a long year since the last of them chugged over the roads.

It is difficult to ascribe to any one cause the complete disappearance of the three-cylinder four-cycle engine, which only a few years ago made a bold bid for popularity. Probably the chief, if not the only, reason for its quick demise can be attributed to the rapid rise of the four and six-cylinder motors. However, despite the perfection of these two types of motor and their universal adoption for even the smallest powers, it would seem that there may have been some slight oversight of the advantages of the three-cylinder engine in the possibility of its adoption for light commercial vehicles, for instance, where the uneven torque and vibration of the one- or two-cylinder engine constitute its principal drawback to more general employment.

Within the past year or so both of these types of engines have been brought to a higher state of perfection than ever before and their objectionable features have been rendered less objectionable by several hundred degrees. Development has been particularly noticeable in the case of the two-cylinder engine which has been adopted by a large number of light commercial vehicles. Here, though vibration has been reduced to the minimum possible, in view of the constructional difficulties imposed by the type, irregularity of torque still remains and is one of the things which cannot be overcome, except by the addition of at least one more cylinder.

"Those who understand the principle of the two possible arrangements of the two-cylinder engine (excluding the V type)," says the foreign writer who asked the question, "will grant that if comparatively steady torque is obtained by having the explosions occur at equal intervals, a bad mechanical balance results as the two pistons move up and down simultaneously. If, on the other hand, the even torque is sacrificed to obtain a better mechanical balance by having one piston moving up while the other is moving down, it is nevertheless questionable whether there is any actual gain. Consequently it is to many persons a case of four cylinders or none."

"Yet," he continues, "if any one seriously asks why the three-cylinder engine disappeared, it is extremely difficult to get a reasonably satisfactory answer. It is important to remember that the three-cylinder engine has a power stroke for every two-thirds of a revolution of the crank shaft, and from the point of view of mechanical balance the three-cylinder crank arrangement would seem to be ideal, because instead of the crank throws being in the same plane, as in the four-cylinder, we have the throws arranged at 120 degrees apart, which constitutes practically a no dead-center system. True, there is a slight overlapping of the stroke of one cylinder into the stroke of another, which must mean a small sacrifice of efficiency, but surely the excellent mechanical rotary balance of the three cranks must amply compensate for this.

"There is no apparent difficulty with the ignition or carburation for the three cylinders. Certainly, with regard to the latter, the general arrangement of two-cylinder engines offers serious difficulties, mainly because of the unequal suction effect on the carburetter. If I were asked what my point of view is as to the ignoring of the three-cylinder engine I would suggest that it is the extra work involved in making the three-throw crank as compared with the four-throw. This latter, as anyone can see for themselves, is a comparatively simple piece of work.

"The three-throw crank, however, is a very different problem. Furthermore, there is the question of arranging for intermediate bearings; this is relatively a difficult matter compared with the four-cylinder crank. The three-cylinder engine, in the view of many of those who used it in the old days, ran even superior to the four-cylinder, and in the matter of climbing hills, there are those who say that no four-cylinder they have used comes up to the old three-cylinder in the point of uniformity of torque, and that the three-cylinder was the next best to the six-cylinder. Therefore I submit that the three-cylinder engine is a type which might with the greatest advantage be revived. It must be remembered that the machine tools available for the making of crankshafts are far ahead of any used, say, five years ago, and I venture to think that if it be the fact that the crankshaft problem is the real one, it should not be in these days of advanced types of machine tools a difficult one to overcome.

"The three cylinders, 'en bloc,' would occupy little more room than the present two cylinders, so that from the point of view of compactness no fault can be brought against it. It ought also to make a lighter engine than the four-cylinder of equal power. Whether it would be as cheap or cheaper to make than a four-cylinder is a question which is open to discussion, because presumably more time and money would have to be put into the making of the three-throw crankshaft. Whatever difficulties may appear in the way of its revival, the need for an alternative to the four-cylinder will unquestionably be felt, and the three-cylinder is well worth consideration."

"Little Six" Added to Knox Line.

By way of supplying the demand for a lighter six-cylinder model built along substantially the same lines as its older and heavier six-cylinder model, the Knox Automobile Co., Springfield, Mass., whose reputation has been spread no less by the excellence of its pleasure cars than by the dependability and durability of its commercial vehicles and fire apparatus, has added to its line a new model which is to be known as the Knox "little six." Though the new car bears all the Knox earmarks that have become familiar, it differs in several ways from its prototypes. Perhaps the most noticeable difference is in the radiator, which is of the pointed V-type, which gives promise of attaining popularity. The motor is rated at 46 horsepower, the cylinders measuring 4⅜ x 5½, and among other noteworthy features reflecting the latest ideas in up-to-date design, is equipped with "silent" chain driven cam and magneto shafts. Bodies are the usual roomy, easy riding creations and are mounted on a chassis of 130 inches wheelbase. The price of the new car in any of several open type bodies and including complete equipment is $4,350; with limousine or landaulet bodies the prices are $5,350 and $5,400, respectively.

Chalmers Begins Factory Enlargement.

Supplementing the addition of a two-story shipping building and several new test sheds, the Chalmers Motor Co., Detroit, Mich., has found it necessary still further to increase its manufacturing facilities, and operations immediately will be commenced on a four-story wing which will serve as a connecting link between the assembling and machinery buildings. The new structure, which is to be of reinforced concrete and steel, 191 x 71 feet, with 55,000 square feet of floor space, is but the beginning of extensive expansion which shortly will be undertaken. Arrangements also will be made for the erection of an additional building of the same size and shape as the three already in use, which are 60 x 400 feet and four stories in height. It is estimated that the new building will cost in the neighborhood of $75,000 and that its equipment as planned at present will bring the total valuation up to between $150,000 and $200,000.

Venezuela Adopts the Metric System.

Venezuela has adopted the metric as the official system of weights and measures, and has made its use obligatory in the courts and other public offices. An exception is made in the case of documents originating in a foreign country.

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INCREASING FACTORY EFFICIENCY

How Manufacturers Raise Standard of Workmanship and Output Simultaneously—Diverse Factory Processes.

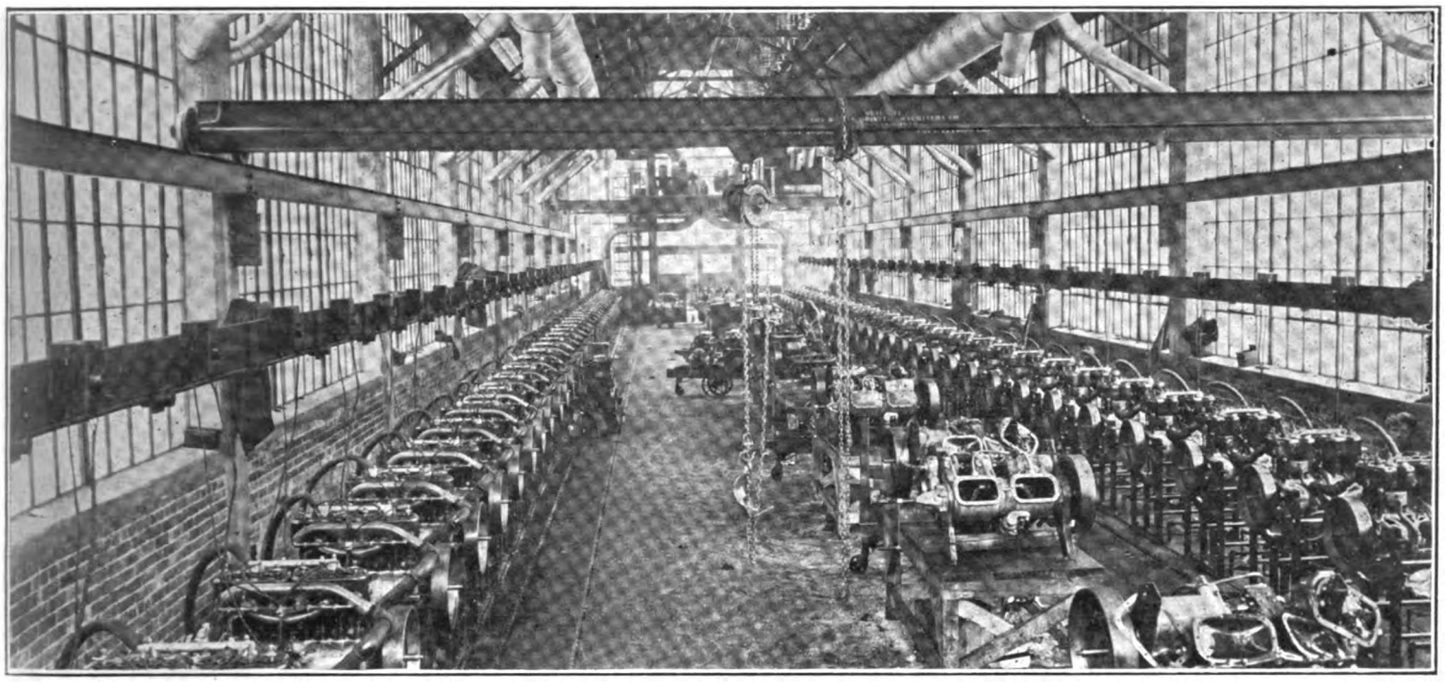
To those who never have had the opportunity to view an automobile factory going "full blast," so to speak, the sight never fails to prove an impressive, if not an awe-inspiring, one. The same statement applies in the case of those who perchance may have seen one factory and only one. For the variety in methods of increasing efficiency and output and raising the standard of workmanship simultaneously almost is legion. Each factory production manager or efficiency engineer has his own particular ideas regarding the best way of accomplishing results.

It is likely that nearly every one who drives a car realizes in a vague sort of way that certain parts can be made and finished, and are made and finished, a great deal better by machinery than by what has come to be styled "old-fashioned" hand methods. For instance, there are few who do not know of full automatic screw and bolt machinery—machines that turn out perfectly finished screws and bolts and nuts literally by the thousand without the necessity for human help other than that which is required to set and start the machinery. All these machines are absolutely automatic in operation. One man runs three of them, as a rule. Or, rather, the three machines keep the one man running to carry away the finished products. Some of them complete one operation before commencing the next, and others complete three or four operations all at the same time. Still others turn out completely finished parts on which nine operations are completed at the same time. Needless to say, under the old regime the time required for one man to complete the nine operations, requiring nine alterations of tool and machine setting, would have been far more than nine times as long as the machine requires. This is merely one little instance of the manner in which efficiency has been increased—the cost of producing the parts is approximately one-ninth the cost of machining them by hand.

And where automatic machinery is not used or cannot be used by reason of the work in hand, the ultimate result is much the same, for practically everything is machined in jigs. For instance, some small part, such as a bell crank, requires to have three holes drilled in it. It is fastened in a jig by means of only one screw and a wing nut, and the operator places it alternately under the three spindles in a gang drill. Thus the work is done in but a fraction of the time that ordinarily would be required if each hole had to be "spotted" first and drilled afterward. Often a great many holes of different sizes are drilled at once. The gear case forms an excellent example of this kind of work. The finished aluminum casting is clamped in a jig, a templet is placed over the surface to be drilled, and all the operator has to do is to set the drill to work. Trained mechanics scarcely are necessary, for practically nothing is left to the judgment of the operator, who has only to set his templets and start the machinery.

That there are practically no planing or shaping machines in use in any of the factories to-day scarcely need cause surprise, for such machines are inefficient in that no work is done on the "return" stroke. Their place has been taken by milling machines which work steadily and without loss of time or motion. And some of the work that is done in these machines is nothing short of remarkable. As an example of what may be accomplished by constantly seeking to establish better methods, the manner in which cylinder castings are machined in the Ford plant is illuminating. The machine that does the work is not inordinately complicated—as is some of the other automatic machinery—but its capacity for work and its accuracy caused more than one of the engineers who attended the recent S. A. E. convention in Detroit to pause and wonder. The machine mills three surfaces on no less than 12 cylinder castings at one mouthful, so to speak. The four Ford cylinders, be it remembered, are cast in a single block. At other plants, cylinder castings are machined in much the same way, as are crankcases, gear boxes and other bulky castings which require to be surfaced on three or more sides. Needless to add, no matter what may be the part undergoing treatment, it first is clamped securely in a jig, and not the least interesting part of the jigs themselves is that seldom are more than two screws required to hold the work. In most cases a single screw, usually provided with a wing nut, suffices. Thus it requires the minimum of time to make a part ready for machining.

To the layman who may have looked at his lubricating oil bill askance, the first impression of almost any of the factories is that a really tremendous amount of oil is wasted. On nearly every cutting tool a stream of oil as thick around as a man's finger impinges. Where oil is not used soda water takes its place. Contrary to the



MOTOR TESTING HOUSE IN THE STUDEBAKER FACTORY SHOWING THE TRAVELING ELECTRIC ENGINE STARTER

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thoughts of the visiting motorist, however, the oil is not "used up" in the sense that it is lost after having slopped all over the work. Instead it drains downward through a series of screens into a sump in the bottom of the machine and is pumped up and over the work again. Each machine carries its own oil pump and the oil is maintained in circulation constantly and thereby cooled. As a matter of fact, there is remarkably little waste, all things considered. Incidentally, to the man who has had occasion to do odd jobs on a small lathe, the cutting speeds and the depth of cut taken off prove a revelation. High speed tool steel is used, as a matter of course; that is to say, the tools hold their edge and temper even if run so hot as to be dull red. In turning down gear blanks, for instance, a cut almost a quarter of an inch in section is taken off and the lathe tool soon becomes so hot that the black cloud of oil smoke that overhangs the machine all but obscures the work. Though it may startle the uninitiated to see the smoke, and the rate at which the machines are forced, nothing feazes the operator, for the table of cutting speeds is laid down by the factory engineer, who knows the exact limit to which the different machines must be worked in order to obtain the greatest efficiency. The steel is cut off just as easily and with just as little fuss as so much cheese is cut. It is true that there is a really terriffic strain on the machinery, but the machinery is heavy and is designed to withstand the strains; it operates day in and day out without falter.

Methods of testing and "running in" engines scarcely are less interesting than production methods, particularly, as is the case in the Ford plant, when the number of finished and tested engines turned out each day runs into the hundreds; on the day the S. A. E. delegation visited the plant it was announced that just 325 completed cars would be sent away from the works that day, the raw material entering at one end of the vast shops and the finished products issuing at the other end. Under such conditions it is absolutely essential that law and order and system prevail and that each engine be set up and run and tested in the shortest possible space of time consistent with thoroughness.

In order to facilitate the work, the test house is a long, narrow room with about 100 testing blocks ranged along either side in two long aisles. The modus operandi is much the same in both the Ford and Studebaker plants, a photograph of the Studebaker testing room being reproduced herewith. As the motors come from the final assembly room, they are picked up by an overhead travelling crane and deposited upon the testing blocks. Here, too, the jig system of holding work prevails, and each motor is fastened down securely by four thumbscrews.

As is fairly well known, every new motor is more or less stiff, and it sometimes is more than a one-man job to induce an engine to start and to keep running under its own power. In both the Ford and Studebaker plants the work has been made a four or five horse job, however, and is thereby rendered correspondingly easier. Running the length of the rooms, at the flywheel ends of the testing blocks, there is a narrow-gauge railway track which mounts a small truck carrying a big electric motor, power for the motor being collected from two overhead wires, after the manner that has been perpetuated by the common variety of trolley car. The electric motor is equipped with pulley and a belt and runs continuously. When it becomes necessary to start one of the motors under test, the electric motor is moved adjacent to the testing block, the belt slipped over the flywheel of the engine, and if the engine does not start immediately, it can be "turned over" indefinitely until the proper carburetter adjustment has been made. In fact, all the motors are started with the gasolene turned off, the carburetter adjustment being made while the engine is running under the persuasion of the electric motor. Where a battery system of ignition is used, the ignition wires remain stationary over each engine. In the Ford plant, the four wires which attach to the spark plugs are attached to a small board which is drilled with four holes corresponding to the location of the plugs. The board is then merely slipped over the plugs and the high tension current jumps the short distance between the tops of the plugs and the terminals on the board. In this way the time required to make ready an engine for test is materially shortened. The actual test consists of a run the duration of which is governed by the condition of the engine, as shown by frequent inspections.

Of course, where production is less stupendous and more time is available, more elaborate testing methods can be used, in which connection it may be remarked that there scarcely are two manufacturers whose testing equipment is the same, or who use similar methods. In practically every case, motors first are run for several hours "on the belt"—that is to say, they are set up on a testing block and are run from the overhead shafting by means of a belt over the flywheel. They do not run under their own power, the preliminary "running in" being merely to smooth down bearings and cylinder walls. Afterwards they are set up on testing blocks in the test house and are run for varying lengths of time under their own power. In some cases they are run under load while in other cases they are not.

At the Peerless plant, in Cleveland, for instance, the engines are run several hours light and then are run eight or ten hours under a water brake load. Afterward ,they are transferred to another testing block and a horsepower reading taken with a Tracy fan dynamometer. At the Winton plant an entirely different method is used. As in the other case, the motors first are run "on the belt." Then they are placed directly in the chassis which is to be their final resting place and run for hours light. Finally the whole chassis is removed to the testing apparatus, which consists of an electric dynamometer. The dynamometer is connected to the engine through the intermediary of the propeller shaft and the change gear mechanism, and in this way practically the whole car is tested at once, speeds being shifted occasionally in order to "run in" the gears as well.

A somewhat similar method of engine testing is used at the Stearns plant in putting the final touches on the Knight engines with which the pleasure cars are equipped. The engines first are "run in on the belt," after which they are mounted in chassis and are to all intents and purposes ready for the road test. Instead of being sent out on the road, however, the cars are run into a courtyard and backed up to a high wall. The rear of the chassis then is hung up by means of steel rods and long vertical belts are slipped over both rear wheels. The belts turn big wooden fans built on platforms arranged on the side of the building. The test therefore includes the engine and the change speed mechanism and goes a little further than the Winton test in that the differential mechanism also is included. This portion of Winton cars, and, in fact, all other cars, is tested, of course, when the cars are sent out on the road for the final abuse to which the corps of road testers subject them.

At both the Packard and Peerless plants the running-in process is carried out on specially constructed tracks which encircle the works. On these tracks the cars are run until they meet the approval of the final inspector, no matter whether the distance be 100 or 1,000 miles. Afterward they are sent over the roads as a matter of course. The Packard track is slightly smaller than the Peerless track and encloses an athletic field equipped for baseball and other field sports, even to a commodius grandstand.

Vent Hole That Should Be Screened.

Though it is fairly well known that much of the so-called carbon that collects in engine cylinders to cause loss of power and otherwise evidence its unwelcome presence enters by way of the air intake in the form of common road dust, it may not be so well known that a considerable quantity of dust may also find its way into the float chamber through the minute hole which is placed there to prevent a vacuum being formed over the fuel. It is impossible to plug the hole up, of course, without interfering with the proper operation of the carburetter, but it is possible to cover the hole with a small piece of fine wire gauze. Air then will be admitted to overcome the vacuum which otherwise would be formed, and the greater portion of the dust and road dirt, at least, will be excluded. It is needless to explain that if the dirt is permitted to find its way into the float chamber it will clog the needle valve or the fuel line and will cause undue wear in the float mechanism.

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MEANING THAT HIDES IN CURVES AND DIAGRAMS

How Sinuous Lines Are Made to Impart Accurate Information When Understood—Pressure, Vacuum and Distance Measured and Recorded by Mechanical Fingers—Disentangling Facts from Curlicues That Befuddle the Brain of the Unknowing.

"It looks like the path of a Kansas cyclone," said the man who was not an engineer. "That other one looks like the baby's first picture of a bird What good are they?"

"Why, they're indicator diagrams," said the Designing Engineer, as if that settled the matter for good and all.

"Oh!" mused the untechnical one, dubiously. "I thought so; I've seen things like it in high-brow dissertations and sich like. But they always are Chinese puzzles to me."

"Chinese puzzles!" exclaimed the D. E., in a scandalized voice. "Why, these are verbatim reports of the proceedings inside the cylinders of gasolene engines, translated into English. Look at this one; you can see exactly where the charge was ignited—late in the stroke—and you can see what happened afterwards in the high pressure at the end of the stroke and the sharp dip to the atmospheric line——"

"Easy, easy! I'll take your word for it. I know you fellows are expert decipherers of cryptograms and readers of hieroglyphics; but I want to know if any human being with only the normal equipment of brains can make head or tail of one of those—those—birds?"

"Certainly," replied the D. E. "And if you're 'game,' come around at lunch time and I'll give you a little course on curves that will make you a little more respectful to curves in general and indicator diagrams in particular, and show you interesting things where you thought there were none."

The man who was not an engineer was "game" and he went, and for all his flippancy he was interested and enlightened. It is a rather strange fact that of all the men who are interested—vitally interested—in various ramifications of business that are intimately connected with the gasolene motor, very few outside of the designing departments know how to get any information from an indicator diagram. Even among the men in the factories such knowledge is comparatively rare, and as for the sales department, one might as well look for the proverbial sewing tool in a pile of cow-fodder as for enlightenment on indicator diagrams from any of the members of a sales force. And yet the subject is not by any means of unfathomable depth. Of course, it is like almost any other detail of engineering in that the greater one's familiarity with mechanics and engineering the more it is possible to extract from a diagram; but the principles that govern the indicator "card" and its interpretation are sufficiently simple for the comprehension of almost anyone.

The principle upon which a pressure curve is constructed—incidentally, a curve, in engineering parlance, may be a perfectly straight line—is illustrated, in its simplest form, in Fig. 1. A strip of paper, with lines ruled horizontally, is made to move horizontally at a uniform rate of speed.



FIG. 1—SIMPLE PRESSURE CURVE

The ruled lines are numbered, the figures standing for, say, pressure. A pencil point rests on the paper; by means which are immaterial in the present instance the pencil point is made to move upward with increase of pressure, and downward with decrease of pressure. When there is no pressure it rests on the bottom line, which, therefore, is called the atmospheric line, or the line where only atmospheric pressure exists. If the paper moves along when

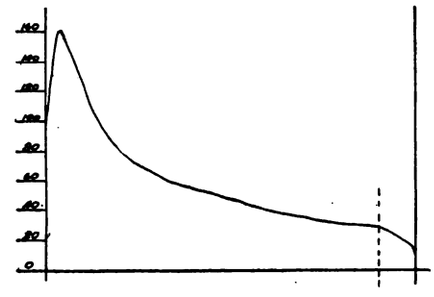


FIG. 2—EXPANSION

there is no pressure to move the pencil, a straight mark will be traced along the atmospheric line, but the instant pressure commences, the pencil will commence to rise, tracing the tell-tale line as it goes. Obviously, the paper must be so ruled, with reference to the work it is expected to record, that the values indicated will be correct. This also is a detail that must be taken for granted. If the pressure rises at a uniform rate, the pencil will trace a straight line that will slant upward at an angle directly proportioned to the rate of pressure increase. Should the pressure rise instantaneously, the line of course would go straight up. If the pressure rises and falls an undulating line will indicate the fluctuations.

Such a curve is an extremely simple one, and can be followed without the slightest difficulty; it is natural and comprehensible that the recording line should rise when the pressure rises, and fall when the pressure falls. And, to carry the matter a step further, it is equally natural that should a partial vacuum occur instead of pressure—or, more correctly speaking, if the atmospheric pressure should be reduced—the recording line should drop below the atmospheric line. But when a second factor is introduced into the production of a curve it becomes a little less simple.

To get back to the indicator diagram, let it be assumed that it is desired to make a curve of the pressure during the power stroke of a motor, ignoring the rest of the cycle for the present. The length of the diagram will represent the length of the stroke of the motor. Fig. 2 shows such a curve. For the sake of simplicity, it will be assumed that the paper moves forward while the piston makes its power stroke, the motion of the paper and of the piston beginning and ending exactly at the same instant. Just after the beginning of the stroke, as a rule, the pressure in the cylinder will be maximum, for the charge has been compressed and ignited and the sudden expansion, or explosion, sends the pressure skyrocketing for an instant. Thus, when the stroke begins the pencil will be high up in the diagram, indicating high pressure at the very beginning of the stroke. The pressure line drops away rapidly, however, in the early part of the stroke, because the difference in temperature between the burning gases and the cylinder walls is so great that a great deal of heat is transferred to the walls and thence to the jacket water, and as the temperature decreases the pressure is correspondingly reduced. At the same time, the piston begins its stroke and the space the gases must fill is increased, which further decreases pressure. As the difference in temperature decreases the drop in pressure becomes less marked, and the curve becomes flatter—a tendency that is increased by the fact that while the outwardly moving piston constantly increases the volume of space to be filled, and so tends to lower the pressure, the ratio of volume increase becomes less and less as the piston moves

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further from the cylinder head. To illustrate this point: Suppose there is a clearance of one inch between piston and cylinder head at the end of the compression stroke. When the piston has moved out one inch the volume of space will be doubled, or increased 100 per cent., but the second inch that the piston moves will increase the volume only 50 per cent., the third inch 33 1-3 per cent., and so on, in a constantly decreasing ratio. After the piston passes mid-stroke and commences to slow down as it approaches the lower dead center, the pressure drops still less.

If this diagram is divided or scaled off horizontally, so that the divisions represent pounds pressure, it will be an easy matter to ascertain just what pressure was attained at any point in the stroke; and with the instruments used for making such diagrams it is known to a nicety just what pressure is required to produce a curve of a given height. Thus it is by no means difficult to scale off a diagram after it has been traced.

Toward the end or "toe" of the expansion

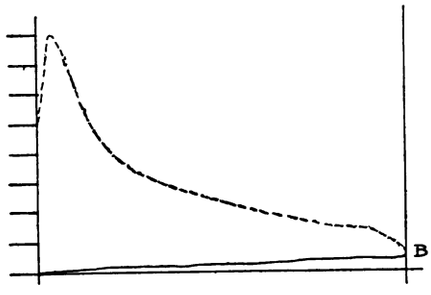


FIG. 3—EXHAUST

curve there is an abrupt downward tendency of the line, showing that something has occurred to cause the pressure to drop, for only a drop in pressure can cause a drop in the line. This is caused by the opening of the exhaust valve. It is found, by measurement, that the point where the valve commenced to open is one-tenth, say, of the length of the stroke. As the stroke involves half a revolution of the crankshaft, which means rotation through 180 degrees, or half a circle, the exhaust valve opens one-tenth of the 180 degrees, or 18 degrees, before the end of the stroke. The curve continues, with a sharp downward trend, to the end of the diagram—that is, to the end of the stroke. As yet, however, the pressure has not reached zero, though the stroke has been finished and the exhaust valve is wide open; therefore it is clear that there still was considerable pressure as the piston stopped at the dead center—35 pounds, according to the scale. This completes the expansion stroke, for the line having reached the end of its movement, must turn back, just as the piston must. The next stroke is the exhaust stroke, and it is shown in Fig. 3. The expansion stroke, already followed, shows in dotted lines.

While the piston was on dead center, B, with the exhaust valve open, considerable gas was exhausted and consequently there was quite a drop in pressure before the piston had fairly started on the upward or exhaust stroke. The speed of the piston, pushing the gases ahead of it, kept them fairly well packed, so to speak, and prevented the continuation of the rapid pressure drop. Nevertheless the pressure becomes lower and lower, approaching nearer and nearer to the atmospheric line, until at the end of the exhaust stroke, there is no pressure at all. Evidently, then, the exhaust valve and passages are of sufficient size. Had they been too small, so as to choke the egress of the gas, the piston would have pushed the gases faster than they were able to escape, and consequently the pressure would have piled up and the exhaust line would have been kept higher above the atmospheric line; in an extreme case there might even have been a sort of

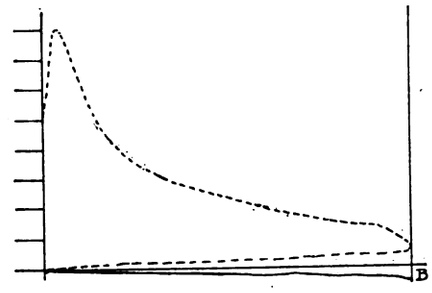


FIG. 4—INTAKE

hump in the line at mid-stroke, indicating that at the point where the piston was moving fastest it had pushed so hard against the choked gases as to cause an actual rise of pressure, which, of course, would be what commonly is called back pressure and means serious loss of power. In the normal diagram, however, the back pressure is not excessive, and at the end of the stroke there is no pressure. This ends the exhaust stroke; the exhaust valve closes and the intake valve opens, and the suction stroke begins.

Fig. 4 is different from all the preceding figures because it deals with partial vacuum instead of pressure above atmosphere; it represents the suction stroke. If the intake valve could be made as large as the head of the cylinder there could be no vacuum at any speed an engine could attain, and the suction curve would follow along the line of atmospheric pressure. Such a valve is impracticable, however, and unnecessary, and with a valve of ordinary dimensions the vacuum formed is very slight, as the small drop of the line indicates. Just as a small valve would produce back pressure on the exhaust stroke, so a small intake valve would produce a retarding effect on the piston on the intake stroke, and it would be indicated by a drop in the line instead of the rise or "hump" that would indicate pressure. At the end of the stroke B the cylinder is filled with gas, and, as the line shows but a slight drop at the end of the stroke, it is evident that there was little vacuum when the piston arrived at the dead center, but that the cylinder was filled with gas at slightly less than atmospheric pressure.

The compression stroke shown in Fig. 5, starts from the atmospheric line, where the intake stroke finished. The pressure rises, as the piston decreases the space in which the charge is imprisoned by the closed valves, and forms a curve that is similar to the expansion curve in that it rises at first slowly and then more and more rapidly, as the space in which it is confined decreases in the same ratio as the increase of volume in the expansion stroke. If the curve were allowed to continue it would sweep up to about 85 pounds pressure at the end of the stroke; but it is not. When the pressure has reached about 70 pounds and the stroke is within a few degrees of its end, the pressure suddenly shoots up, and while the piston is standing still for a brief instant at the top dead center, the pressure continues to rise, going straight up. There is, of course, only one thing that could cause such a sudden and violent and practically instantaneous rise

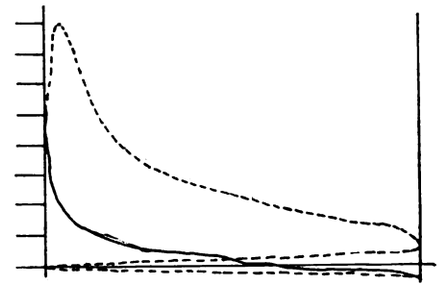


FIG. 5—COMPRESSION

in pressure—the ignition and expansion of the charge. The point where the gradually sweeping curve turned suddenly upward is where the spark occurred—a few degrees before the termination of the stroke, or a little advanced. The pressure was maximum just after the piston started on its power stroke. This completes the diagram.

Fig. 6 is a normal diagram and is a practically exact copy of one taken from a very good small motor running at about 1,300 R. P. M. It is, of course, necessary that one should be familiar with the mechanical sequences in a gasolene motor if the indicator diagram is to have any meaning; but for one who understood nothing about the motor the diagram would hold no interest anyway.

The diagram that has been used for illustration is smooth and symmetrical and quite easily read. If it is thoroughly understood, however, the "Kansas cyclone" variety of diagram becomes less terrifying, and acquires a meaning. Fig. 7, for instance, though not violently erratic, shows some abnormalities. It will be noticed that there is an absence of very high pressure at the commencement of the power stroke, but the pressure does not drop until the piston has traveled about a fourth of its stroke.

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the pressure keeping up notwithstanding the increase in volume of the space in the cylinder. Looking for a reason, the curve is traced back a little and there is no evidence of the sudden upward shoot that indicates rise of pressure due to ignition before the end of the stroke; the pressure rises, however, while the piston is on the dead center, so the charge must have been ignited at the end of the stroke—in other words, ignition was somewhat retarded. Maximum pressure was reached just after the piston started its outward travel. It might be thought that the maintenance of such a high pressure for such a considerable proportion of the stroke would result in high power. By following the curve, however, this idea vanishes, for when the exhaust valve commences to open near the end of the stroke a great deal of the pressure still is there, as is indicated by the height of the pressure line above the atmospheric line. All through the exhaust stroke there is considerable pressure on the piston, which means that the engine is doing extra work in pushing out gases at

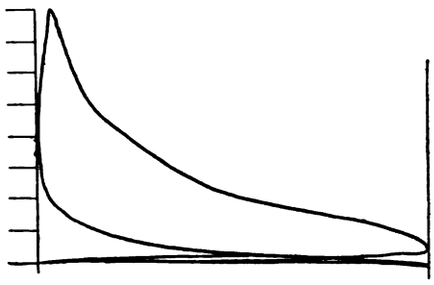


FIG. 6—TYPICAL DIAGRAM

high pressure; moreover, the gases are abnormally hot because there has not been time for complete combustion, and this indicates clearly the way in which retarded ignition overheats a motor, the pressure and temperature, which go together, being abnormally high throughout the stroke, and the exhaust being very hot indeed.

Following the steep exhaust curve, it will be noticed that it never reaches the atmospheric line, showing that there was back pressure throughout the exhaust stroke. Moreover, at some distance from the end of the stroke there is a sudden rise in pressure. The natural thought would be that the exhaust valve closed too soon, and the trapped gases caused the pressure to go up. The objection to this theory is that the pressure does not continue to rise clear to the end of the stroke, as it would if the gas was trapped by closed valves; moreover, if the exhaust valve closed very early it would also open very early, and there is nothing in the expansion stroke curve to indicate that the exhaust valve opened too soon. Here is where a knowledge of the conditions under which the diagram was made is essential. It happens that this particular diagram was made from a multiple cylinder motor in which the exhaust strokes overlapped—that is, the exhaust stroke of one cylinder began before the exhaust of another was completed. With the charge burning slowly and the exhaust issuing from the valves at abnormally high pressure, there was a great deal of pressure in the manifold. So when the diagram shown in Fig. 7 was approaching the end of the exhaust stroke, another cylinder began to exhaust,. and the pressure in the manifold backed in through the open exhaust valve and raised the pressure, as shown by the rising exhaust line.

Fig. 8 is a rather curious diagram, showing very clearly the effect of late ignition, together with a rather slow-burning mixture. The compression curve shows that the compression of the charge was carried to the end of the stroke without interruption; there is no break in the smooth sweep of the line. Ignition did not occur until just as the piston commenced its outward stroke, and, as the mixture was a poor one, it fired somewhat slowly and the pressure actually dropped somewhat during the

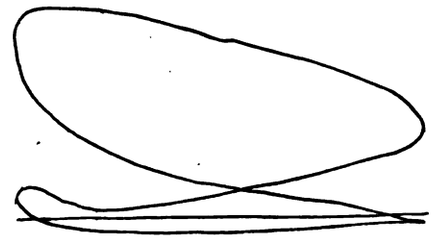


FIG. 7—ABNORMAL CARD

early part of the stroke. Once well ignited, however, the pressure went up in a high, swelling curve; the pressure remained very high up to the opening of the exhaust valve. There was a clear, free exhaust, for the pressure drops quickly after the opening of the exhaust valve. There is a curious feature of this diagram that not infrequently is observed.

The exhaust pressure not only falls to zero, but it goes further, and a partial vacuum is formed before the end of the exhaust stroke, as the diagram shows, for at the point where the exhaust curve reaches the end of the stroke it indicates a negative pressure, or vacuum. This is due to the inertia of the gases which passed out at very high velocity earlier in the stroke having a tendency to draw after them the slower-moving tail-end of the cylinderful. Naturally this results in a scavenging action that leaves comparatively little burned gas in the cylinder, and the inspiration of a very full charge is facilitated. In the case of a multi-cylinder engine the exhaust from other cylinders sometimes assists in bringing about this effect in some cylinders, while having the opposite effect on others, as indicated by the diagram in Fig. 7.

If an engine is turned over by external power and an indicator diagram taken from it, the curves will be quite different from those made while running under its own power. The suction or intake stroke will make the same line, as will also the compression stroke; but in place of the power stroke, during which the charge of gas burns and increases the pressure upon the piston, there is a simple expansion of the air that has been compressed. As the compressed air merely returns to its original state, passing through the same stages as in the compression stroke, only in the reverse order, the expansion curve will be a duplicate of the compression curve if there is no loss of compression. If there are leaky valves, or if air can blow past the piston rings. the expansion line will, of course, drop below the compression curve, because the pressure will be less at any given point in the stroke. At the end of the expansion stroke, at which point the curve will touch the atmospheric line again, the exhaust valve will open and the exhaust line will, if the valve and passages are free, follow almost exactly along the atmospheric line, showing a little pressure, perhaps, if the engine is being turned over very rapidly.

Fig. 8 is a genuine case of "Kansas cyclone," but really is not nearly as bad as it looks. The secret of it is that it consists of two superposed diagrams taken from the same cylinder under different conditions. The upper line indicates late ignition and

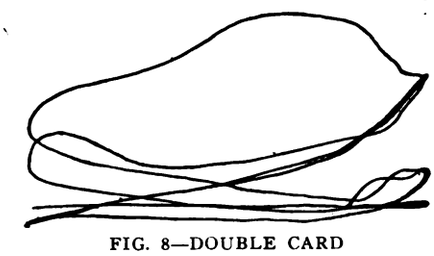


FIG. 8—DOUBLE CARD

slow burning of the charge, with high pressure throughout the stroke and high-pressure, hot exhaust. The sharp rises at the end of the exhaust stroke indicate early closing exhaust valve. The second line from the top shows that a charge of very weak or else over-rich gas was taken in, for it burned excessively slowly, the line following the compression line for some distance and then, as the flame began to gain a little headway, the pressure rose, though very feebly, until it reached its maximum just before the opening of the exhaust valve. The sudden drop at the end of the stroke, when the valve opened is clearly shown. Had the charge failed to ignite at all, there would have been nothing on the diagram to show it, for the expansion line would have followed the compression line back to zero, as already described. Even the reason for the faulty burning of the charge may be "doped out" from this freaky looking diagram. Ignition was very late, and the slow-burning charge was still hot and under high pressure when the exhaust valve opened, so that there was considerable back pressure. At the end of the exhaust stroke the early closing of the exhaust valve trapped quite a considerable volume of this dead gas, and it was, of course, carried over until the next intake stroke, when it mingled with

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the incoming charge and diluted it; probably the mixture was none too good, anyway, judging from its slow combustion, as shown by the upper expansion line.

As has been said, it is important in reading a diagram that something should be known of the conditions under which it was made, if all the information it contains is to be extracted. But in a general way, an indicator diagram will tell its story even if nothing is known of the conditions. It is possible so to juggle the conditions as to make a freak diagram that is absolutely undecipherable without the key. It is possible to alter the adjustments of the indicator so that certain parts of the diagram will be exaggerated, or magnified, for the purpose of studying them more closely. This often is done in the case of the curves indicating the intake stroke and of the ends of exhaust stroke curves. But an ordinary, normally proportioned diagram is by no means a puzzle, and a little study of the curves, always mentally associating each line with the piston stroke it represents, will result in an understanding of these useful sources of information that cannot fail to be of interest, if not of actual value.

Graphite That Serves as a Foundation.

When a motor has been taken down for a thorough cleaning it is a good plan before putting it together to rub into the dry surfaces of the cylinder walls, pistons and rings and the main connecting rod and piston pin bearings — in fact, all points where there is friction—graphite mixed with cylinder oil to the consistency of a rather thin paste. If the lubricant is applied with a swab on the end of a stick it will be less disagreeable to handle. It should be vigorously rubbed in and then most of it wiped off. The theory is that the graphite lays a good foundation for subsequent lubrication and ensures a good start without danger of early cutting or scoring of bearing surfaces.

Tongue Test for Low Tension Current.

If there is any doubt as to whether there is current flowing through the low-tension wiring of an ignition circuit it can be set at rest by placing the two terminals on the tongue, not touching each other. If there is current flowing there will be a sharp, sour taste, but if there is no current there will be no taste; the stronger the current the more sharp the taste. Obviously this test is exclusively for very low tensions, and to try it on strong current circuits would cause decidedly unpleasant effects in the tasting apparatus.

Using Magnet to Test Tool Steel.

One method of ascertaining the correct heat for tool steel that is to be hardened is to use an ordinary permanent magnet. The steel becomes non-magnetic just before reaching the proper temperature for quenching, and therefore should be very slightly heated after it ceases to show attraction for the magnet.

BACK-FIRING RENDERED HARMLESS

How Fires from "Sneezing" Carburetters Can Be Prevented—Removing Gasolene Drippings Out of Harm's Way.

A blaze started by the back-firing of the motor may or may not result in serious damage to the car, according to the quantity of fuel there happens to be for the flames to feed upon. If there is no way for gasolene drippings from the carburetter to escape, the chances are favorable to a more or less costly little fire, while if

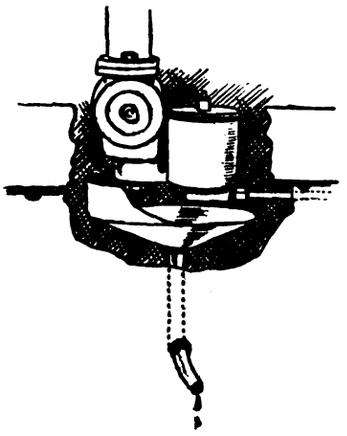


FIG. 1—SHOWING WIND SHIELD

there is no place where gasolene can accumulate there can be only a few drops to burn, and the fire will quickly die out. It is true that the pans of most cars are provided with drainage openings, but this hardly is enough, for if there is much flooding of the carburetter there will be a sufficient quantity of gasolene in the pan to

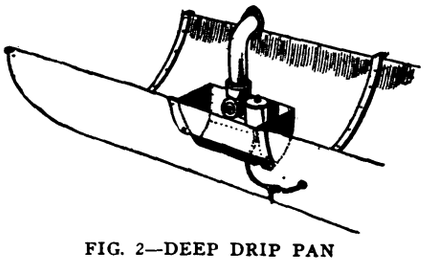


FIG. 2—DEEP DRIP PAN

make quite a fire, and the oil that is pretty sure to cover the bottom of the pan will help things along considerably.

The proper way is to arrange to drain all drippings directly away from the carburetter by building a little drip pan for the carburetter and running a drain pipe, so that the liquid may fall on the ground, out of harm's way. As there is a strong draught of air over the carburetter when the motor is running, the dripping gasolene will be blown back and away from the carburetter drip pan if some provision is not made to prevent it. In Fig. 1 there is a shield at the front for this purpose, while in Fig. 2 the carburetter is partly enclosed by the pan. The illustrations, from "Autocar," are self-explanatory, and show two methods that may be used; but they will not do for all cars, of course, owing to variations in construction details. However, the idea is well illustrated. In Fig. 2 there is a slot in the bottom of the pan which serves a double purpose; it is the outlet for the dripping fuel, and it provides an opening through which the gasolene pipe passes to the carburetter.

A good plan that sometimes can be carried out is to cut a hole through the main pan directly under the carburetter, and from this run a sort of box that will partly enclose the carburetter. If the carburetter floods the gasolene will simply drip through the hole and will be prevented from finding its way into the main pan by the boxing.

Figures Showing How Horse Isn't "Going."

Despite the enormous increase in the use of automobiles and the repeated utterance of the cry "The horse must go," official statistics, compiled by the Agricultural Department at Washington, tend to prove that while the horse may be "going," his pace is not fast enough to cause undue concern. According to the tables that are printed in the department's 18th annual year book, there still are no less than 23,778,481 horses in the United States, not including the Philippine Islands; Canada is next, though far behind, with a total equine population of 2,303,725; the total of Central America, 27,873,248; South America, 9,155,425; Austria-Hungary, 4,196,634; European Russia, 23,548,000; United Kingdom, 2,253,418, bringing the total of Europe to 43,502,876. On January 1, 1867, the number of horses on farms in the United States was 5,401,000; price per head, $59.05; total value, $318,924,000. On January 1, 1912, the 20,509,000 horses were valued at $105.94 per head; total farm value, $2,172,694,000. There are 609,000 horses reported on farms in the State of New York, which is in excess of any other North Atlantic State. Illinois, Iowa, Missouri, Nebraska, Kansas and Texas each have over 1,000,000. Despite the enormous "home production" of horses, there were imported into the United States during 1911 nearly 10,000 animals at an average price of $280.63. The number exported, however, exceeded this number by upward of 15,000.

Rosin that Facilitates Bending of Tubes.

Rosin makes a very good filling for brass or copper tubes which are to be bent, and prevents the formation of kinks and dents without necessitating that the ends of the tube be plugged. It, however, should not be used on pipes which are to be used to carry fuel to the motor, because it is slightly soluble in gasolene and is likely to cause carburetter trouble.

A bearing that is subjected to considerable heat will require more lubrication than one that runs in a cool place, as the heat tends to drive off the oil and leave the frictional surfaces dry and liable to cut.

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MUST STOP WHEN STREET CARS STOP

New York's Proposed New Ordinance Near to Passage Despite Impractical Requirement—Reforms Recommended.

Although it contains a provision which, if enforced, would make automobile travel on Broadway—or any other busy street having trolley service—almost an impossibility, the so-called Folks ordinance for the regulation of automobile traffic in New York City seems fair on its way to passage by the Board of Aldermen. When it came up for consideration on Tuesday last it was referred back to the committee on a technicality.

The particular clause in the proposed ordinance which would likely serve to attach unpopularity and impracticability to the measure is a section which, among other things, requires that when an automobile overtakes or approaches a street car which has stopped to take on or let off passengers the automobile shall stop not less than six feet from the street car and remain stationary until the street car has proceeded.

The aldermen, however, in commenting on the ordinance, declare they are acting for the "greatest good to the greatest number."

The speed limits proposed are 25 miles in outlying and thinly populated sections; 10 miles in turning corners, at bridge approaches and in passing schools on school days between 8 A. M. and 4 P. M.; 15 miles in crowded streets, and 18 miles on Broadway and Amsterdam avenue north of 72d street, Coney Island Boulevard and Eastern Parkway, Brooklyn. Proposed penalties are: First conviction, fine of $25 to $100 or fine and 15 days; second conviction, double the first penalty; third conviction within six months, $100 and 30 days.

Alderman Ralph Folks, chairman of the special automobile speed regulation committee appointed by the Board of Aldermen to investigate and draft the ordinance, in submitting his creation made numerous suggestions based upon information gained by the committee in driving automobiles through congested thoroughfares and less crowded streets at various speeds, in ascertaining the efficiency of brakes and the distance required to stop at different speeds and in a study of conditions under which accidents most frequently occur. What, if made a law, would place owners who drive on the same plane as chauffeurs was the suggestion that the owners, also, be licensed to drive, the committee being able to find little reason for discrimination. Chairman Folks also urged the vesting in police magistrates of the power to revoke licenses, instead of centralizing this power in the Secretary of State, and that the identification of drivers of cars, with any previous offenses against the speed law, be a matter of police record he would have filed at police headquarters a card bearing license number, address, signature and photograph of the driver. More motorcycle policemen were urged as a means of coping with present conditions, and a right enforcement of the tail lamp regulation was recommended as an aid in identifying cars at night. Referring to the part pedestrians play in causing accidents, the report says:

"While pedestrians have many just causes for complaint, they are also responsible in many cases for their own injuries, and unnecessarily annoy the drivers. According to the records of the police department, some 800 accidents out of 2,500 occurred in the middle of the block or remote from corners. Vehicles should be entitled to free and unobstructed passage of the highways aside from street crossings."

1913 Refinements That Date Far Back.

Of the comparative youth of the motor car industry there can be no question; as compared with the steam engine, the railroad, the telegraph and even the telephone it is a veritable mushroom, so far as rapidity of growth is concerned, though anything but mushroom-like in its solidity. Quick as the mechanical development has been, however, it is rather interesting to notice that new ideas and new developments usually are revivals or amplifications of much older attempts along the same lines.

For instance, in 1899 the old Automobile Company of America quite nonchalantly asserted that its new models—meaning the cars for 1900—would be equipped with automatic starters. Incidentally, the motors in question had three cylinders and were rated at as much as 10 horsepower. During that period of the development of the automobile the wire wheel was very much in evidence—in fact, they were the rule. Winton and Packard cars had wire wheels; the latter at that time was built by the Ohio Automobile Co., of Warren, O.; so did the Knox, which then had only three wheels; the Stanley steamer, and all the other steamers, which were then very much in evidence; the Peerless, which was a diminutive "motorette" with a little crank to steer with; the Locomobile, then a "tea-kettle"; the Elmore, which was a two-cycle machine but used piston-opened ports instead of the distributing valve and two-diameter cylinder now employed, and many others, most of them having names long ago forgotten. Charles E. Duryea, who at that time had not mastered the art of simplified "speling," was doing most other things in his own original way, including the employment of three-wheeled chassis and one-hand control, and was having no end of trouble convincing the public that he had the right idea, notwithstanding the fact that the Knox people also advocated three wheels. Twelve years or so ago there was a demand, apparently, for a "poor man's car," and one of the machines built to meet the call was the little Autocar, which weighed 500 pounds, cost $500 and had a motor of four horsepower.

NANTUCKET AGAIN IN A FERMENT

Motor Fire Engine Now Excites Motorphobe Colony—Amusing Situation That Exists On the Sleeping Island.

Nantucket, which, as everyone may not know, is in Massachusetts, is again suffering a rush of gasolene to the head. But the other "rushes" were quite unlike this one. In the others the inhabitants of the island united against the automobile and the automobilists as invaders. And they have been so successful that it is set down in the statutes that the general automobile law does not affect the rules of Nantucket, which rules exclude motor vehicles during the summer months. But the present trouble is an internal affair, a struggle between the progressives and reactionaries, and the columns of the local paper are filled with letters to the editor in which opinions are expressed as to whether motor cars should be allowed on the island.

The cause of it all is the progressiveness of the fire wards—as they call firemen in Nantucket—in buying an automobile chemical truck to strengthen the fire department. There was a lot of discussion before so radical a step was taken, but at the annual town meeting early in the Spring an appropriation of $5,900 was put through and the truck was bought and delivered in time so that it could be run off the wharf before the bars were raised against motor vehicles on June 15.

The automobile was duly installed in its house and a chauffeur engaged. But when the fire wards began to take the machine out to "exercise" it trouble began. They held that it was necessary to run the machine every day to keep it in condition so that it could respond promptly to alarms. It became rumored that the firewards were taking joy rides over the state highway to Siasconset, and that other people were being taken along. Something of this sort apparently happened, for the automobile germ got a foothold and soon developed into a formidable party in favor, not only of "exercising" the fire truck, but even of throwing open the island to all automobiles.

The discussion has run high, some holding that the fire wards did not need to "exercise" the machine, and that if they did the tuning up process could be accomplished just as well by jacking up the wheels and running the motor in the fire house, as by running the machine about the streets, to the consternation of the inhabitants and the horses—for Nantucket horses are traditionally afraid of automobiles in summer, though the Boston Transcript meanly insinuates that some of them that come down from New Bedford and elsewhere in the spring never show signs of fear until they reach the island.

It was agreed that the automobile chem-

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ical might be "exercised" between 7.30 and 8.30 in the morning, this time being satisfactory to the livery stable keepers, though the arrangement has caused a protest from people who say their morning sleep is broken. Still, that is the time the machine may be seen on the streets, not every morning, but whenever the fire wards consider it necessary to keep it in proper trim to respond to alarms.

But great have been the changes since the automobile chemical arrived. Already the ancient offices of "alarmists" and "keeper of the town's powder" have been discontinued, all these office holders having lost their positions on the first of July. There used to be a "watchman" whose station was in the tower and whose duty it was to be on the lookout for fires and give the alarm, which the "alarmists" transmitted. A fire alarm system was installed and the "watchman" lost his position. But the "alarmists" and the "keeper of the town's powder" have continued until now.

One of the early calls for the automobile chemical resulted in a great disappointment, for the machine did not show up with the speed that was expected. The reason was soon found to be that the man who ran it was asleep in his house some distance away when the alarm was run in, and it took him some time to get to the fire house and get the machine in operation. This caused the fire wards to decide to post the driver of the automobile chemical in its house, and since then the machine has done great work in fighting chimney fires and other incipient conflagrations. It has even won some friends because it has put out fires without arousing the entire community, which was the old custom.

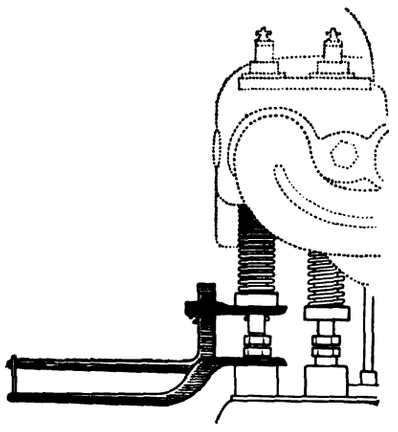
The era of progress has advanced so far that the driver of the automobile has put up a wireless station on the engine house to catch the government time every day for the benefit of the townspeople. There is talk of having a chief of the fire department, and it has been said that the record of the island of never having had a fire since 1846 that has spread beyond the building in which it originated is not due to efficiency of the department, but just to luck. Some go so far as to say that had Nantucket owned an automobile chemical in 1846 there would have been no "great fire" of that year.

But the talk started by the arrival of the automobile chemical and by the alleged joy rides that followed has spread from its original subject and now the whole question of opening up the island to automobiles is being vigorously discussed. There is a war of words, and every time the new chemical goes out it seems to be strengthening the side of the progressives. They are now suggesting that Nantucket horses would get over being frightened at automobiles if they had a chance to see them, and that, furthermore, the livery stable men could make more money carrying people about in automobiles than they do with their surrey hitches that have for years been the accepted mode of transportation, barring the railroad.

But the conservatives are not idle and they are putting up stiff arguments why automobiles should be kept off the island. They say it is for rest and quiet that people come there, and they do not want the things they have at home. People come to Nantucket from all over the country to get away from noise and street dangers, and if automobiles were introduced it would spoil the place and its summer business. Furthermore, the narrow and crooked town streets and the sandy country roads are arguments as strong now as they ever were against the introduction of automobiles.

Tool that Aids Valve Spring Removal.

One of the most disagreeable of the little jobs connected with the ordinary work on a gasolene motor is the removal and



replacement of valve springs, especially if they are of considerable stiffness, as is the case in big motors. Various makeshift methods of prying up the springs are employed, so that the key can be withdrawn and the valve freed from the spring action, but at best they are a nuisance and often result in pinched fingers, if nothing more serious. One of the many tools designed to facilitate this work, and one that has advantages peculiar to itself, is the Cummings plier, made by the Wright Wrench & Forging Co., of Canton, O., for the Cummings Plier Co., of the same place.

As the accompanying illustration shows, the tool is extremely simple and easily handled, and as its name indicates, it resembles somewhat a big pair of pliers, except that the jaws are forced apart when in service instead of closing. Both jaws are forked; one is rested on the top of the valve lifter guide and the other, which is adjustable as to its distance from the lower jaw, is placed under the spring or between the coils, when pressure on the handles compresses the spring and permits the removal of the key. The process, of course, is reversed in replacing a valve spring. The tool is drop forged from steel and is case-hardened; its weight is 14 ounces.

Where Temperature Control Is Essential.

In the pouring of molten metals for making castings, as well as in the hardening, tempering and other heat treatment of steels, the regulation of temperature is of the most vital importance and upon it may, and usually does, depend the success of the work in hand. For instance, when making light, thin brass castings, it is necessary to bring the molten metal to a much higher temperature than that which is required merely to melt it; it must be made sufficiently fluid to run easily into the intricacies and small places left by the pattern. But the metal must be poured immediately the requisite temperature is attained; otherwise the excessive heat will drive off the softer ingredients—tin, lead and zinc—in the form of vapor, and the resulting castings will be far from perfect.

On the other hand, for making heavy castings the employment of very high temperatures will result in excessive shrinkage, so that the shrinkage allowance made by the pattern-maker will be exceeded—in other words, the castings will be under size. The more highly developed alloy steels require the most careful handling as to temperature, and an error in the heating may very easily cause the metal to deteriorate so that it will be no better than common cheap steel. Ordinary tool steel is quite hardy in this respect, comparatively speaking, for if a little overheated its "virtue" often can be restored by working under the hammer at the proper forging temperatures; but once the alloy steel is burned or seriously overheated it is practically ruined, as far as its superiority over common steel is concerned.

Tempering Tools Without Use of Fire.

A machine shop "stunt" that at one time was quite popular as a test of skill consisted in hardening and tempering a screwdriver or other small tool in the finishing process without the use of fire. It was accomplished by doing the last of the rough shaping on an emery wheel, pressing the steel hard against the wheel, so that it was heated red hot by the friction, and then plunging it into water, which, of course, hardened the steel outright. Another heating on the emery wheel tempered the steel, the tempering being checked by a second quenching when the proper color was in evidence. The final grinding was done on a grindstone. The secret of doing this job properly lay in allowing sufficient metal for the rough grinding, so that the requisite heat would be attained just before the blade reached the proper degree of thinness, leaving sufficient stock for the tempering and the finishing grinding.

One Way to Test Heat of Babbit.

Overheating babbit metal when melting it preparatory to pouring bearings is injurious to the quality of the metal and should be carefully avoided. A good rough and ready guide is to thrust a dry pine stick into the melted metal, which should be just hot enough to make the wood smoke, but not hot enough to char it or cause it to flame up.

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INEXPENSIVE GASOLENE STILL A POSSIBILITY

Abundance of Motor Fuel to Be Had Through Proper Methods of Distillation—Crude Oil Capable of Yielding Much More Gasolene Than the Refiners Extract From It—Government Experiments in Production and Use of Liquid Gas That Promise Relief.

Although the none too gradual rise in the price of gasolene naturally is attributed by the producers solely to the relation between supply and demand, it reopens the vast field for speculation as to what fuel will take the place of the lighter petroleum products when the supply will have fallen so far short of the demand as to make the utilization of gasolene as a motor fuel prohibitive, and while shale oil, alcohol and other things invariably are suggested, it may be said with positiveness that the possible supply of gasolene is so great that, were the most made of it, little would be heard of "gasolene famines" or sky-high prices.

Commercial gasolene, which is used universally as a motor fuel, is a blend or mixture of three of the lightest distillates which are produced from crude petroleum and represents but 22 per cent. of the volume of the crude oil from which it is produced. The other 88 per cent. is made up as follows: Kerosene, 35 per cent.; distillate or fuel oil, 10 per cent.; lubricating and cylinder oils, 15 per cent.; vaselene, residuum and loss, 18 per cent. It long has been known that the heavier petroleum products, the kerosene and distillate which have chemical formulas more complex than the formula of gasolene, will when heated to the proper temperature and protected from the atmosphere so as to preclude the possibilities of burning, "crack"—that is, split up into two or more products with more simple molecular formulae, lower specific gravities and lower boiling points. The physical properties of these new compounds, when the cracking operation is carried on under proper conditions, are similar to the properties of gasolene and naphtha and their behavior when used as fuel in internal combustion motors is identical with the behavior of gasolene. It naturally follows that, were the process of cracking the heavier oils perfected and practiced, at least 45 per cent. more of the total volume of crude oil distilled would be available as gasolene, or as substances not substantially different from gasolene in behavior.

Upon the way in which the cracking process is carried out, and the constituents of the retort contents, depend the physical properties of the products, so that by adopting certain temperatures and conditions a gas such as Pintsch gas or Blau gas is formed which readily can be liquefied by compressing under reduced temperature. The liquid products can be transported in the same way that carbon dioxide is transported, in pressed steel tanks capable of withstanding heavy pressures. These liquefied gases, although not of the same consistency as gasolene, can readily be used as motor fuel.

A process which should be looked upon as one possessed of great possibilities of future development is that of liquefying the very volatile petroleum products which are contained in natural gas. The commercial possibilities of the latter process are pointed out at great length in a pamphlet entitled "Liquefied Products from Natural Gas: Their Properties and Uses," which recently has been issued by the United States Bureau of Mines. Among other things, this interesting little work says:

"In some of the petroleum fields, particularly in new fields, where the yield of oil and gas is abundant and the methods of handling are necessarily crude, considerable quantities of oil and great quantities of gas are wasted in various ways. In the older fields, where effective methods of handling and storage have been more fully developed, the loss is less.

"Yet in almost all the petroleum fields of the country more or less natural gas has been allowed to escape without restraint, and at some places enormous quantities have been wasted. Even to-day, in practically every field of the country, one can see many gas torches needlessly burning the entire 24 hours.

"Natural gas may be divided into two great classes, (1) a so-called 'dry gas,' known and used for many years as the natural gas of commerce, and (2) a gas containing easily liquefiable vapors, which is known in the vicinity of the oil fields as a 'wet gas.' The latter class forms the basis for the so-called 'natural gasolene' industry.

"By fractionating natural gas either during or after liquefication, four products can be commercially obtained. Roughly, these four products may be described as follows: (1) The gaseous product, the common natural gas of commerce; (2) the semi-liquid product, known as the new 'wild' product, which should be used only as a liquefied gas and should be held in high-pressure steel containers only; (3) the light liquid product, or light gasolene, used for blending with heavy naphthas; and (4) the heavy liquid product, or ordinary high-grade gasolene.

"The liquefaction of natural gas products was early recognized as of possible commercial importance.

"Pasenmeyer and others procured gasolene in commercial quantities near Titusville, Pa., in 1904, by collecting the condensations in the gas mains. The yield of gasolene so obtained was further increased in 1905 by chilling the pipes with cold water, and from 1905 to 1909 the yield was still further increased by the establishment of small, low-pressure, single-stage compressing plants. In the last few years the industry has made remarkable strides.

"Up to the last two years the general practice in the manufacture of liquid natural gas was to make the product by compression of the gas in single-stage compressors operated at a pressure of 150 to 300 pounds per square inch. The one product thus obtained, so-called 'natural gasolene,' was run into a tank and 'weathered.' The weathering consisted in allowing the lighter portions to volatize spontaneously and escape into the open air until such time as the boiling away of the liquid had practically ceased. Thus the process involved a loss of 25 to 50 per cent., or even more. This loss was an absolute waste, not only of power and of cost of operating the engines and compressors but of the product itself.

"The next step in the industry was to pass the waste gases (of which only the small quantity used for power had been utilized) from the single-stage compressor through a higher-stage compressor, thereby getting a second and more volatile product —a 'wilder' liquid—which was run back into the first tank and mixed with the first or heavier condensate. The mixture was then again weathered to a safe degree, whereby it lost the greater part of the more volatile product that had been condensed in the second stage.

"Recently the process has been improved another step, in that the first stage compressor product is run into one tank and handled as ordinary gasolene; the second stage compressor product is run into a second tank and handled as a lighter gasolene, with which the heavy refinery naphthas can be enriched or enlivened.

"The last mentioned method of using the second stage compressor product should receive wide recognition, and a market for the product should develop that would be no mean factor in the industry. Blending in the proportions of, say, 1 part of the product to 4 or 5 parts of the refinery naphthas makes these heavy naphthas more volatile and of greater value as fuel for automobiles; it also greatly increases their general usefulness. The proportions to be used in blending, however, must be determined more definitely by test.

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"The natural gas of this country frequently contains light products that do not condense in the second-stage compressor, and for which it is practicable and necessary to install three, four, and even higher stage compressors. These light products —true gases at ordinary temperatures and pressures—can be compressed and liquefied, but the liquid gases so obtained must be handled as gases and not as oils. The mistake heretofore made in the 'natural gas gasolene' industry, as some have recognized, has been the attempt to handle the light gaseous products as oils and not as gases.

"The natural gases of the Appalachian oil fields are not the complex mixtures generally reported, but are composed of the paraffin hydrocarbons with carbon dioxide and nitrogen as impurities. The gases that issue under considerable pressure or that are produced in quantities sufficient to justify piping for distant consumption consist principally of methane and ethane, the methane predominating. Small quantities of the higher paraffin hydrocarbons are also believed to be present. Olefin hydrocarbons and carbon monoxide have not been detected in the samples thus far examined by the Bureau of Mines, and oxygen appears to be present only when the sample has been taken in a faulty manner and air has been admitted.

"Natural gases that issue from old wells in which the original rock pressure has diminished contain higher members of the paraffin series, such as propane and butane, in larger quantities, and when a pressure below atmospheric is applied to the wells still larger quantities of the higher paraffins are obtainable. For example, in the oil pool surrounding Tidioute, Pa., a pool that has produced oil and gas for many years, the gas is now drawn from the wells under a pressure of 12 to 13 pounds below that of the atmosphere, and a liquid product is obtained therefrom without the use of artificial pressure or cooling appliances.

"Some natural gases in the United States contain methane only, and such gases are not adapted to the production of gasolene or liquid gas. Gases that contain no paraffin hydrocarbons higher than ethane require a pressure of 600 to 700 pounds to the square inch at 35 degrees C. for the liquefaction of the ethane. At lower temperatures less pressure would be required. Since these high pressures are not used in the commercial plants producing gasolene from natural gas, ethane is not being liquefied in such plants, but a partial solution of the ethane in those paraffins that are liquefied undoubtedly takes place.

"Propane and butane are on the dividing line between gases and liquids and must be handled as such—that is, as heavy gases or as very volatile liquids—and if held must be imprisoned in strong containers only. Pentane, hexane, and heptane are liquids under ordinary conditions and comprise ordinary gasolene.

"The vapors accompanying natural gas are clean and are ready for compression. They are analogous to the manufactured products, but have the great advantage over the latter of being ready made. However, they are at present in a great measure lost to the industries. The vapors should be compressed, as previously stated, but instead of being run into an open tank, or into a closed tank and weathered from it, with a corresponding loss, they should be run into steel containers and held there under compression.

"The multiple-stage compressor may be used for obtaining a number of products, or the single-stage compressor may be used for obtaining one product; then, by allowing this 'wild' product to escape from a common container into a second, a third, and a fourth container, under partial pressures, it may be separated or fractionated into a second, a third, and a fourth product. This compression and later separation or fractionation of a common 'wild' product into several products is, however, a waste of power, as ordinarily the gas should be compressed through several stages directly into its several products.

"Experiments in the production of liquid gas were made at an experimental test plant installed by the authors at the compressing plant of the Penn Gasolene Co., Follansbee, W. Va. The test plant consisted of a small gas engine, a small compressor, cooling coils of ordinary 1-inch iron pipe immersed in a shallow tank for holding the cooling liquid, and a storage tank made of heavy 6-inch steel tubing. Pressures up to 600 pounds were obtained, and with the use of ice and liquefied gas prepared in the adjoining compressing plant, the product was cooled to 2 degrees C. as it entered the storage tank. The crude gas as it came from the wells was subjected to different pressures and temperatures, and the amount of liquid produced was measured. The quantity of crude gas liquefied was obtained from subsequent volatilization of the compressed product. Samples of the liquid material were passed through a small experimental meter to determine the gas yield per gram of liquid. The following table gives the results of these experiments, in which practically complete liquefaction was obtained:

Results of Compression and Cooling Tests of Natural Gas.

Pressure exerted in liquefaction (pounds per square inch).	Temperature of cooling coil at entrance to storage tank. °C.	Volume of gas per gram of liquid. c. c.
415	2.0	600.9
430	4.0	....
506	9.1	....
600	77.5	478.1

"A pressure of 415 pounds at 2° C., of 430 pounds at 4° C., of 506 pounds at 9.1° C., or of 600 pounds at 77.5° C., liquefies practically the total volume of the gas being compressed. Assuming the liquid to be a mixture in which the propane and ethane predominate, 1 gram of liquid will yield 500 to 600 cubic centimeters of gas at 0° C. and 760 millimeters pressure; that is, 1 gallon feet of gas. To determine the feasibility of using for power purposes the gas under discussion, a short test was made with a gas engine. A 10-horsepower two-cycle gas engine provided with a prony brake for absorbing the load, and equipped with the usual electric ignition, was used. The high-pressure cylinder containing the liquid gas was connected through a reducing valve to a small cylinder receiver, capacity about 3 cubic feet, in which a pressure of about 3 inches of mercury was maintained; from this receiver a pipe connection led directly to the engine. No attempt was made to determine accurately the fuel consumption per horsepower-hour, nor to find the compression best adapted for the fuel, the test being made simply to determine its behavior in a commercial type of engine.

"The test was of 30 minutes' duration; full load was easily maintained, and there was no difficulty whatever in keeping the engine up to speed. Throughout the test the engine ran easily, giving no indication of overload; there were no back fires nor preignition. The indications were that the gas would make a satisfactory gas engine fuel. The brake horsepower (10.69) during the run was calculated from the following data:

Avg. revolutions per minute	277.7	
Length of brake arm.....	5.25	feet
Weight of brake arm.....	36.5	pounds
Total weight on scales.....	75	"
Effective weight on scales...	38.5	"

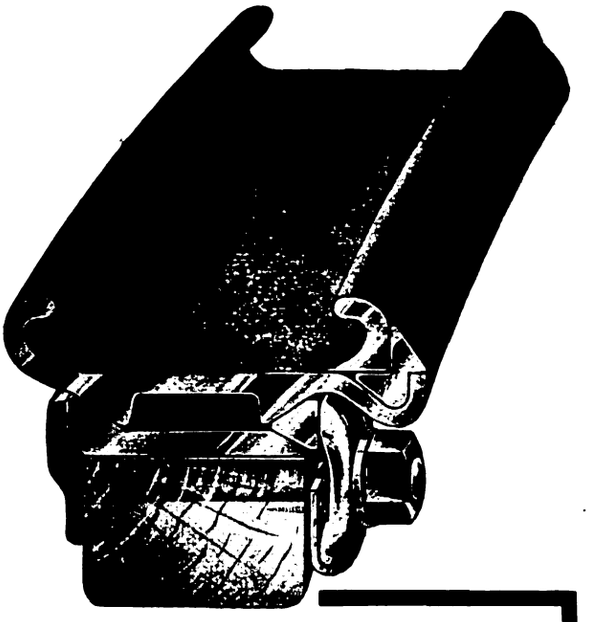
"A cylinder of the liquefied gas was also used for driving a 30-horsepower automobile. A most satisfactory run was made for a number of miles, although no attempt was made to determine the efficiency developed, the only result desired being to demonstrate that the compressed product could be used for automobile propulsion. It was noted that the gas escaping from the container through the regulating valve supplying the engine became chilled and that considerable frost collected over the surface of the valve. The effect would, in general practice, soon freeze the liquid in the valve and clog the pipe entirely. By installing this valve near the engine exhaust the freezing may be prevented.

"The third previously mentioned product of crude natural gas, light high-grade gasolene, is a material that, by co-operation with the refiners of petroleum, can be utilized for blending with the heavy naphthas, thereby, improving the latter and making them more suitable for the propulsion of high-speed automobiles. This use will materially improve the market for the heavy naphthas, and also widen the field of usefulness for the new compression product. The proportions in which the blending should be made to insure some degree of permanency have not yet been established.

"The fourth product from compressing crude natural gas, ordinary gasolene, may be handled in the usual way, and need not be discussed in this paper."

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1,011,029. Roller Bearing. David Franklin Chambers, Lancaster, Pa., assignor to The Star Ball Retainer Company, Lancaster, Pa., a Corporation of New Jersey. Filed Oct. 15, 1910. Serial No. 587,199.

1. A conical roller bearing comprising a circular series of conical rollers, and a cage consisting of corrugated circular plates having the furrows of the corrugations facing and confining the ends of the rollers, said plates having integral spaced partitions spanning the intervening space at an angle to the axis of the bearing and separating the adjacent rollers throughout the bearing.

1,011,032. Internal Combustion Engine. David H. Coles, Brooklyn, N. Y. Filed Nov. 18, 1909. Serial No. 528,754.

1. In an explosive engine, two coaxial cylinders of unequal diameters comprising a power cylinder and a pump cylinder, a piston having heads of unequal diameters working in said cylinders, the piston head of small diameter being provided with a cooling passage for delivering gas to said power cylinder, a compression chamber having a port adapted to register with said piston cooling passage at or near the end of the power stroke and having a valve controlled port normally closed to said pump cylinder, whereby a charge of gas compressed into said chamber by the pump piston during the compressing stroke is delivered under superatmospheric pressure



INDEX TO ADVERTISERS



A

Abbott Motor Co..... 74
Adamson Mfg. Co..... 72
Ajax-Grieb Rubber Co..... 68
American Ball Bearing Co..... 76
American Motors Co..... 75
American Starter & Carburetor Mfg. Co..... 71
Apple Electric Co..... 70
Argo Electric Vehicle Co..... 59
Atwater Kent Mfg. Works..... 60
Automobile Supply Mfg. Co..... 72

B

B & L Caster Axle Co..... 68
Badger Brass Mfg. Co..... 74
Bantam Anti-Friction Co..... 71
Barthel, Daly & Miller..... 66
Bartholomew Co. 70
Benz Auto Import Co..... 69
Bosch Magneto Co..... 67
Bossert Co. 54
Bretz Co., J. S..... 73
Briggs-Detroiter Co. 70
Brown-Lipe-Chapin Gear Co..... 71
Bush Mfg. Co..... 60

C

Cartercar Co. 70
Champion Ignition Co..... 71
Champion Spark Plug Co..... 10
Clarke-Carter Automobile Co..... 69
Colonial Electric Car Co..... 74
Consolidated Mfg. Co..... 74
Continental Motor Mfg. Co..... 59
Covert Motor Vehicle Co..... 69
Cox Brass Mfg. Co..... 71
Cramp, Wm., & Sons, Ship & Engine Building Co. 73

D

Dayton Auto Truck Co..... 74
Dayton Rubber Mfg. Co..... 54
Dean Electric Co..... 16
Detroit & Cleveland Navigation Co.... 76
Diamond Rubber Co..... 73

E

Electric Welding Products Co..... 64
Empire Automobile Co..... 75
Empire Tire Co..... 72

F

Fedders Mfg. Works..... 76
Federal Miniature Lamp Works..... 60
Federal Rubber Mfg. Co..... 63
F. I. A. T..... 74
Firestone Tire & Rubber Co.....13 and 51
Ford Motor Co..... 67
Franklin Automobile Co..... 75

G

G. C. A. Mfg. Co..... 71
Goodyear Tire & Rubber Co., The..... 60
Grant-Lees Machine Co..... 54
Gray & Davis.....Front cover
Great Northern Hotel..... 66
Great Western Automobile Co..... 8-9
Grossman Co., Emil..... 59

H

Hartford Auto Parts Co. Inside front cover
Hartford Suspension Co..... 15
Havers Motor Car Co..... 70
Haynes Automobile Co..... 74
Henderson Motor Car Co..... 69
Hodge & Graves..... 73
Howard Demountable Rim Co..... 59
Hupp Motor Car Co..... 75
Hyatt Roller Bearing Co..... 11

I

Ignition Starter Co..... 59
Inner Shoe Tire Co..... 60
International Accessories Corp..... 71
Inter-State Automobile Co..... 69
Invincible Starter Co..... 71

J

Jeffery-Dewitt Co. 6
Jencick Motor Co. 68
Jones Speedometer 76

K

Kellom & Co., Chas. F..... 60
Kelly-Springfield Tire Co..... 54
King Motor Car Co..... 68
Kinsey Mfg. Co..... 72
Kissel Motor Car Co..... 68
Kline Motor Car Corp..... 69
Knight-Davidson Co. 72
Knox Automobile Co..... 14

L

Lauth-Juergens Motor Car Co..... 67
Leather Tire Goods Co..... 59
Lee Tire & Rubber Co..... 65
Locomobile Co. 60
Lovell-McConnell Mfg. Co., Inside back cover

M

Marion Motor Car Co..... 12
McCue Co. 17
McGraw Tire & Rubber Co..... 59
Mais Motor Truck Co..... 70
M. and P. Electric Vehicle Co..... 75
Mayo Radiator Co..... 3
Metz Co. 60
Michelin Tire Co..... 57
Michigan Buggy Co..... 72
Miller, Chas. E..... 3
Minerva Hardware Mfg. Co..... 60
Moline Auto Co..... 67
Mosler & Co., A. R..... 59
Moss Photo Engraving Co..... 66
Motor Car Equipment Co..... 60
Mott Wheel Works 76
Motz Tire & Rubber Co..... 60
Mutty Co., L. J..... 60

N

National-Acme Mfg. Co..... 54
National Gas Engine Starter Co..... 4
National Motor Supply Co..... 55
National Motor Vehicle Co..... 75
New Departure Mfg. Co..... 68
New Process Rawhide Co..... 76
Niagara Sales Co..... 60
Nordyke & Marmon Co.....18-19

O

Oakland Motor Car Co..... 69
Owen & Co., R. M..... 60

P

Penn Spring Works..... 64
Perfection Spring Co..... 59
Piel Co., J..... 1
Pittsfield Spark Coil Co..... 73
Prest-O-Lite Co. 59
Pullman Motor Car Co..... 70

R

Rajah Auto Supply Co..... 73
R. C. H. Corp..... 5
Remy Electric Co..... 65
Republic Rubber Co..... 59
Royal Equipment Co..... 76

S

Sanford Motor Truck Co..... 53
Schrader's Sons, A., Inc..... 63
Shawmut Tire Co..... 74
Sheldon Axle Co..... 2
Sparks-Withington Co. 59
Speedwell Motor Car Co..... 75
Splitdorf Electrical Co..... 73
Springfield Metal Body Co..... 60
Standard Roller Bearing Co..... 60
Start-Lite Co. 56
Stearns Co., F. B..... 70
Studebaker Corporation.....Back cover

T

Timken Roller Bearing Co..... 7
Tobias, F. H..... 59
Twitchell Gauge Co..... 61
Typhoon Signal Co..... 54

U

United Rim Co..... 76
United States Tire Co..... 68
Underwood Typewriter Co..... 62

V

Valentine Co., J. H..... 65
Volkmar Auto Starter Co..... 73

W

Warner Gear Co..... 65
Warner Instrument Co..... 66
Weed Chain Tire Grip Co..... 60
Western Motor Co..... 72
Whitney Mfg. Co..... 61
Willard Storage Battery Co..... 59
Willys-Overland Co., The..... 20
Winton Motor Car. Co..... 75

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through said piston passage into the power cylinder at or near the end of the next power stroke, cooling said piston and filling the power cylinder with a fresh charge of gas.

1,011,091. Resilient Wheel. Johnson A. Suddarth, St. Joseph, Mo. Filed Mar. 25, 1911. Serial No. 616,834.

In a resilient wheel, a rim; a cushion tire on said rim; a plurality of elastic outer spokes having inclined inner end portions formed therewith; a plurality of elastic inner spokes having reversed inclined inner end portions formed therewith, all of said inclined inner end portions of said spokes having notches formed in the edges thereof; a hub provided with holding means by which said inclined spoke portions are held in one annular alinement therein with said outer spokes and said inner spokes thus placed alternately and thereby inclined from said hub outwardly and inwardly respectively; a plurality of outer springs the inner ends of which are substantially secured to to the outer ends of said outer spokes the outer ends of said outer springs being secured to the outer edge portion of said rim; and a plurality of inner springs the inner ends of which are secured to the outer ends of said inner spokes the outer ends of the last mentioned springs being secured to the inner edge portion of said rim.

1,011,171. Spring Wheel. Carl E. Dunham, Maddock, N. D. Filed Mar. 4, 1911. Serial No. 612,264.

In a spring wheel, the combination of an outer member comprising a felly, a tire, an inner rim and spokes, an inner hub member having disks on its ends, covering disks secured to the inner and outer sides of the inner rim and bearing against the ends of the inner hub member and on the outer sides of the first named disks, the said inner hub member being movable eccentrically between said covering disks, and links connecting the inner hub member and the inner rim, each link comprising a pair of slidably related members enabling them to be lengthened and shortened and co-acting springs on the said links, the inner ends of said links being pivotally connected to the inner hub member, the said links being disposed in groups, each group comprising a radial member and a pair of tangentially disposed members on opposite sides of the radial member, the inner ends of the members of each group having a common pivot connecting them to the inner hub member.

1,011,214. Wheel Fender. Frederick Lillich, Philadelphia, Pa. Filed July 26, 1911. Serial No. 640,566.

1. In a fender for vehicle wheels, the combination with an automobile, of hoods or casings pivotally mounted on the axle stubs of the front wheels of said automobile, and adapted to be held normally in an elevated position in relation to the said wheels, substantially as described.

1,011,217. Friction Transmission Gear. John Clinton Mackey, Detroit, Mich., assignor to Arbron Friction Gear Company. Filed Feb. 4, 1908. Serial No. 414,274.

1. A transmission gear comprising a drive shaft, a sleeve arranged to receive the same, said sleeve being normally rotatable on said shaft, a clutch member on said shaft, a driving gear actuated by said clutch, driven gears in mesh with and actuated by said driving gear, friction plates carried by said driven gears, a friction wheel mounted on said sleeve which mechanism communicates the movement of said shaft to said sleeve, a clutch member on said sleeve and a clutch member on said shaft, said clutch members being arranged for engagement to lock said sleeve and said shaft in such manner that said shaft may be revoluble uniformly with said shaft, substantially as described.

1,011,244. Carburetter. Thomas E. Puddington, Rochester, N. Y., assignor of one-half to Charles L. Briggs, Rochester, N. Y. Filed Aug. 31, 1911. Serial No. 647,076.

1. A carburetter, having a casing adapted to contain liquid hydrocarbon, the lower portion of which is a reservoir, an air inlet pipe leading thereinto, a carbureted air outlet pipe leading therefrom, a series of longitudinally disposed parallel branch pipes mounted in the casing and in communication with the air inlet pipe, each of said branch pipes having a plurality of nozzles, and a series of aprons one to each branch pipe, surrounding its respective branch pipe and having the lower ends thereof disposed with relation to the liquid within the reservoir to saturate the aprons by capillary attraction.

1,011,257. Apparatus for Priming Automobile Engines. Charles H. Smith, Rockford, Ill. Filed Dec. 2, 1910. Serial No. 595,185.

1. In an apparatus for priming explosive engines, a fuel supply tank, pipes conducting fuel therefrom to each of the engine cylinders, a valve controlling the flow of fuel from said tank, said valve comprising a hollow rotary valve member adapted to first receive a definite quantity of fuel and then discharge such quantity at each operation, valves controlling the entrance of the fuel into the engine cylinders, and means for operating all of said valves.

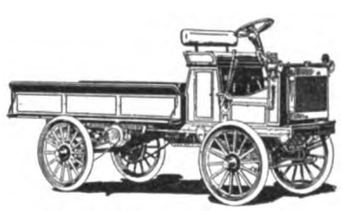
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1,011,275. Internal Combustion Engine. Frederick A. Thurston, Lynn, Mass. Filed Feb. 26, 1910. Serial No. 546,116.

1. A two-cycle internal combustion engine comprising a cylinder, a closed crank case, a piston reciprocating in the cylinder, an inlet port in one side of the cylinder, an exhaust port at the opposite side of the cylinder, a transfer passage contained in the wall of the cylinder opening at its lower end in the crank case, being carried around the inlet port and opening at its upper end into the cylinder, and a conductor for explosive mixture having a connection with a carbureter, being secured to one wall of the cylinder and having one outlet at the lower end of the transfer passage and another outlet at the inlet port.

1,011,277. Anti-Skidding Device. Joseph Toren, Thornton, Ill. Filed Apr. 21, 1911. Serial No. 622,575.

1. The combination with a wheeled vehicle, of ground engaging means carried by a wheel of said vehicle and arranged to be moved into engagement with the ground; a shaft pivotally mounted on said vehicle; arms carried by said shaft; a bar carried by said arms; guides on the axle of said vehicle for said bar; springs arranged to hold said bar in inoperative position; cam shoes at the ends of said bar and arranged to be thrown into the path of said ground engaging means for rotating said shaft, substantially as described.

1,011,278. Headlight Controlling Device. Joseph Torma and John F. Orth, East Pittsburgh, Pa. Filed June 8, 1911. Serial No. 632,043.

1. In a headlight controlling device, a lamp support mounted for turning movement, a rock-shaft, connection between the rock-shaft and lamp support arranged for attachment to an element of the steering gear of a vehicle, an arm mounted for free swinging movement upon the rock-shaft, a link connecting the arm and clip, and a latch carried by the arm and engagable with the shaft to hold the shaft for movement with the arm.

1,011,311. Shock Absorber for Vehicles. Harry S. Bergen, Toledo, Ohio. Filed Sept. 2, 1910. Serial No. 580,210.

1. A spring suspension for resiliently mounting the body of a vehicle upon an axle comprising the combination with an axle of a pair of oppositely extending bell crank levers, one of the arms of each lever connected to the axle, a spring connected to intermediate portions of each lever and to the axle, and a pair of independently horizontally movable members for sustaining the body as to the axle and to which members the arms of the levers remote from the axle are connected.

1,011,332. Vehicle Wheel. Burt E. Dohner and Albert J. Huff, Dayton, Ohio. Filed Oct. 24, 1910. Serial No. 588,626.

1. In a vehicle wheel, the combination with a hub, and a two-part tire casing, of inner and outer retaining rings inclosed between the inner and outer circumferential portions of said casing, an inflatable tire inclosed by said casing and retaining rings, inner and outer clencher rims each consisting of two clamping members with extended circumferential portions which embrace the opposite sides of the casing for a substantial distance, and whereby lateral strain is more equally distributed to the wheel structure as a whole, said clencher rims clamping the inner and outer circumferences of the casing to the retaining rings, and bolts uniting the members of said clencher rims, substantially as described.

1,011,337. Roller Bearing. John F. Foster, Kansas City, Kan. Filed May 5, 1910. Serial No. 559,501.

1. In a roller bearing, a cone, a collar surrounding the same and tapered internally in the same direction as the cone and internally bearing a converging relation to the latter, a plurality of equi-spaced inwardly tapering rollers interposed between the cone and collar and holding the same spaced apart and reduced to form circular grooves between their ends, means projecting into the grooves of said rollers to limit excessive endwise movement thereof, and a cage rotatable with the rollers and consisting of a pair of rings and a plurality of equi-spaced spacers interposed between the cone and collar and adjacent rollers and secured at their ends to said rings; said spacers being diametrically reduced between their ends and in the vertical plane of the reduced portions of said rollers.

1,011,353. Automobile Tire Pump. Otto W. Linstrum, Hoopestown, Ill. Filed Mar. 12, 1910. Serial No. 548,999.

1. The combination with an automobile of a pair of superimposed oppositely disposed pump cylinders formed in one casting having an integral centrally arranged guide projecting from one end thereof; a piston in said cylinders; a scotch yoke mounted to reciprocate in said guide; operative connections between said yoke and said pistons; and an operative connection between said yoke and the engine shaft of said automobile, substantially as described.

1,011,449. Friction Transmission Mechanism. John W. Lambert, Anderson, Ind., assignor to The Buckeye Manufacturing Company, Anderson, Ind., a Corporation of Indiana. Filed June 9, 1910. Serial No. 566,002.

1. The combination of an engine with an engine shaft extending in opposite directions therefrom, a casing secured to each side of the engine in which the outer ends of the engine shaft are mounted, and friction transmission means mounted within said casing and in connection with said shaft.

1,011,469. Vehicle Wheel. Gabriel Mazzeo and Pasquale Iarussi, Newark, N. J. Filed Feb. 11, 1911. Serial No. 607,912.

1. A resilient tire for vehicles, comprising a casing, a plurality of tread-rims supported in continuous alinement exteriorly of said casing, tubular stems connected with said tread-rims, said tubular stems being adapted to penetrate within said casing, ribs or guides secured on opposite sides of each tubular stem, inwardly projecting lugs upon the interior side-portions of said casing, the free ends of which engage said ribs or guides to prevent said tubular stems from turning and said tread-rims from being moved out of their continuous alinement, coil-springs arranged within said casing and seated in each tubular stem to provide each tread-rim with an independent vertical and resilient movement, and a continuous shoe supported or carried by said tread-rims.

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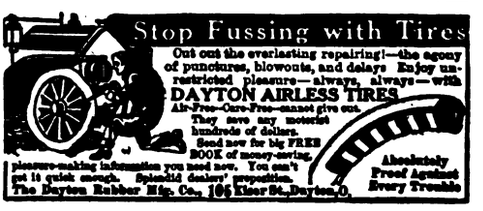
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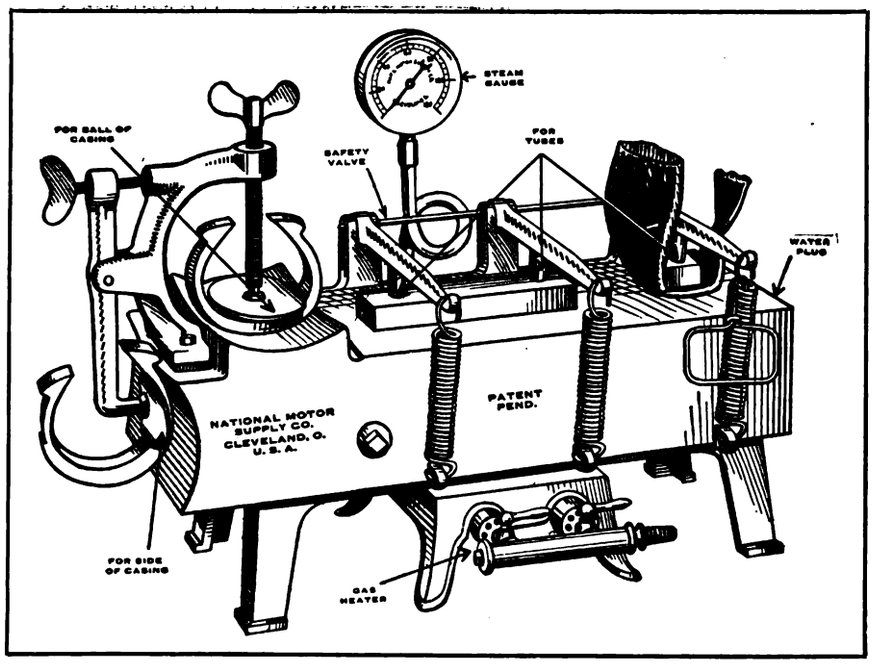
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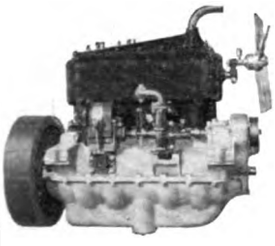
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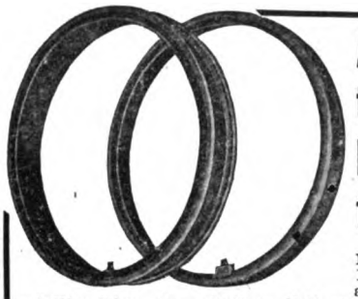
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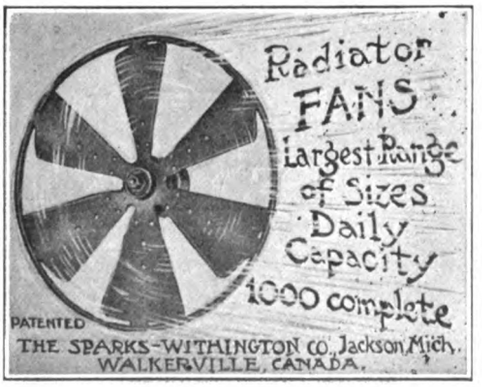
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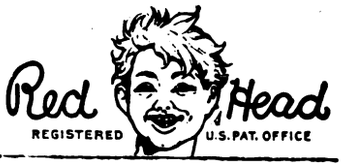
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A. R. MOSLER & CO
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Class A for Electric Lighting
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Manufactured by
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The Tire Perfect!



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Magneto Plugs coax maximum power out of engine.
EMIL GROSSMAN COMPANY, Mfr., New York and Detroit



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Nine-tenths of all accidents to automobiles are caused by skidding or slipping.

Either you skid into the "other fellow" or the "other fellow" skids into you.

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Cannot Injure Tires

Because They Creep

An absolute necessity on both rear wheels and if you want to know what real steering steadiness means put them on the front wheels too.

For your own safety—for the safety of the public, fully equip your car with Weed Chains. Make it your business to get a set today.

The Name "Weed" on Every Hook

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ideal for your motor, write for information-booklet D
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Final and crowning achievement of R. E. Olds, pioneer designer of autos. A standard size 30 to 38 horsepower four cylinder car of modern refinements priced for the present at only $1,055.

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That's what the INNERSHU accomplishes. It's a tough, durable, rubberized fabric formed permanently to tire shape. Ask for circular.
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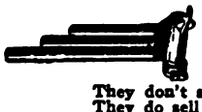
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Is "As Dependable as Niagara"
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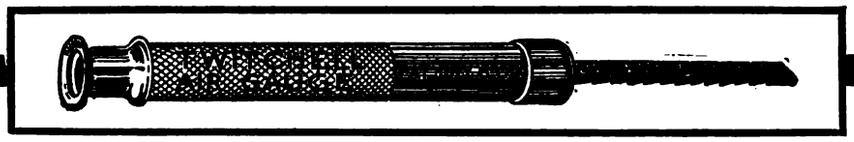


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For Pleasure Cars and Light Delivery Cars
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1—Correct pressure is insured in all your tires.
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3—No rubber washers to wear out or deteriorate as in all other Gauges.
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Correct Pressure for Tires:		
2½"	Tires.....	50 lbs.
3"	Tires.....	60 lbs.
3½"	Tires.....	70 lbs.
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THE TWITCHELL AIR GAUGE IS TIRE INSURANCE FOR ONE DOLLAR.

Can be Obtained from Your Dealer.

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The Most Practical Chain for Motor Trucks

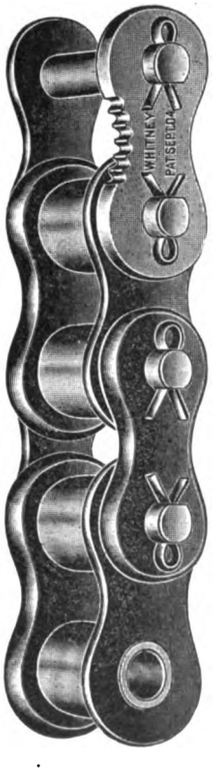
Because the "Whitney" Cotter Detachable Chain can be easily separated at any link and lengthened, shortened or repaired without the use of any special tool. This is of great advantage to truck builders, owners and drivers.

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How do you know what pressure you have in your tires? A

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UNIVERSAL
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(Trade Mark Registered in U. S. Patent Office)



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will tell the exact pressure in your tires at any time, day or night, by simply holding this Gauge to your Valve for a second. Its recording sleeve remains in place, showing the exact pressure in the tire so that the Gauge can be taken anywhere and read, at night to the front of the car into the light of the lamps. After the pressure has been ascertained the Indicating Sleeve can be pushed back into the Gauge with your finger. No catches or snaps to operate or get out of order. This Gauge is 2½ inches long over all, short enough to apply easily to the smallest diameter of wheel and can easily be carried in the vest pocket or the change pocket of your trousers.

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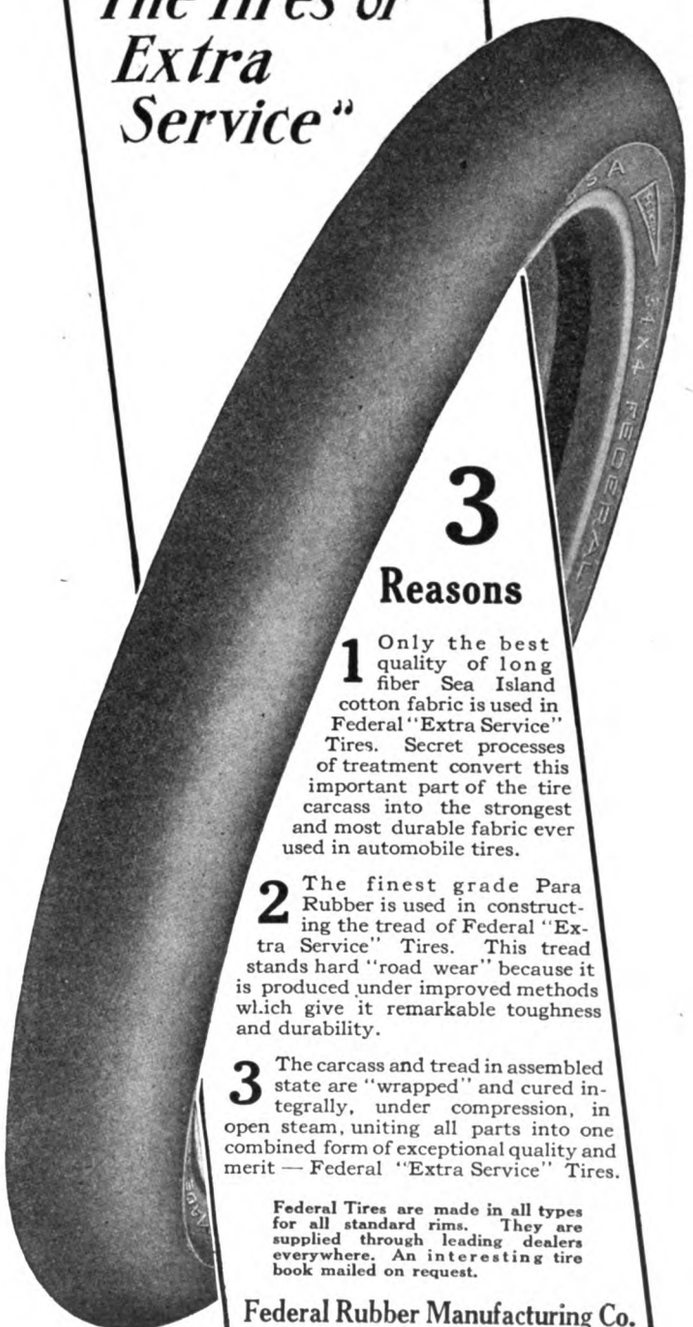
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"The Tires of Extra Service"



3 Reasons

1 Only the best quality of long fiber Sea Island cotton fabric is used in Federal "Extra Service" Tires. Secret processes of treatment convert this important part of the tire carcass into the strongest and most durable fabric ever used in automobile tires.

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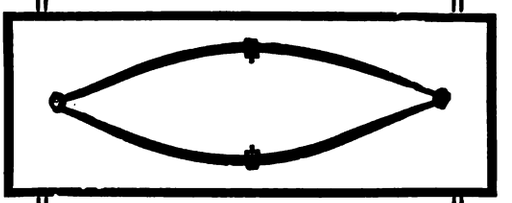
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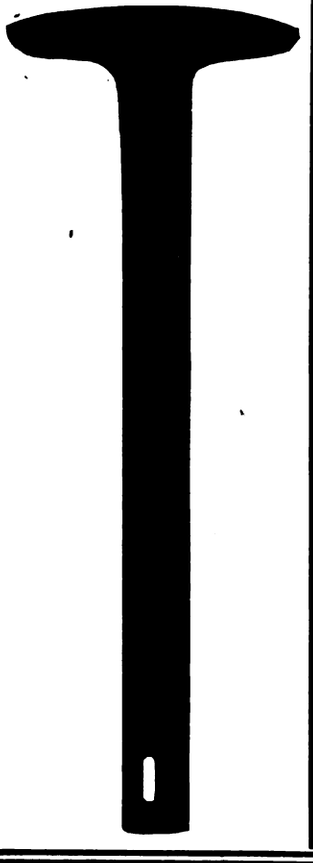
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Your engine leaves the factory running smoothly and sweetly—tuned up to its highest power. Perhaps the valves pit—warp—go out of shape—fail to hold compression. Then the power diminishes, and what can be more aggravating to the driver, who has known the fullness of the pulling power of his motor, than to have it grow less and less?

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IT will cost you practically no more than what you will be forced to pay out for constant repairs on your present ignition system. A new Remy will give your car new life. Here is our exchange proposition:

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Allowance made for any make of Magneto.

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Watch the Prices Drop!

Just as the Hanna self starter—the only 100% efficient self starter that does not foul or soot your plugs—was imitated by those who followed our lead so now is the price of the Valentine manifold starter being met.

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Model K2
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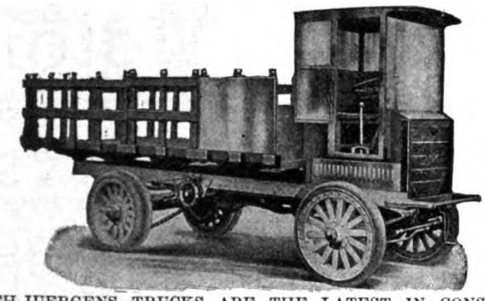
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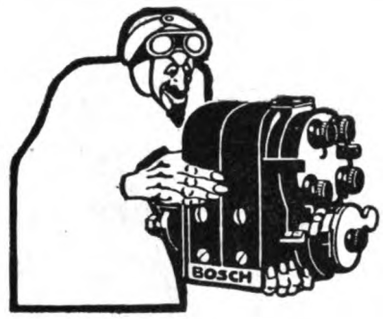
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FOR MOTOR TRUCKS

Jencick Motor Corporation

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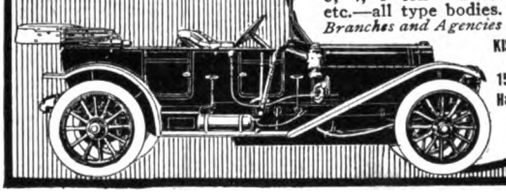
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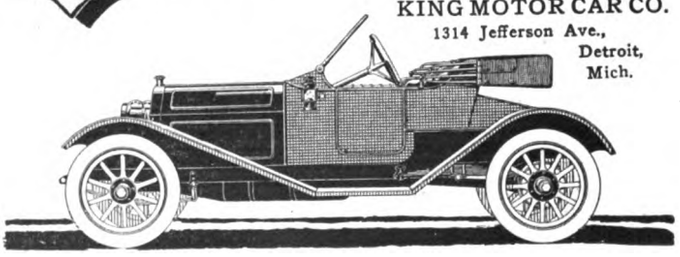
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This new King Roadster has all the features that have made the name "King" famous. That patent rear spring smooths out the bumps so you never feel them.

With Full Equipment, Including Self-Starter, $1190

Terms, territory and detailed description on request.

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United States Tires



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Self-Starting
Detachable Rims

One Quality in All Models

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Factories: York, Pa., Richmond, Va.

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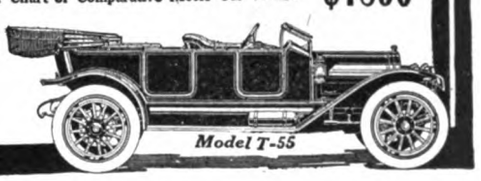
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All Four Cylinder Models
$1200 to $3000
30, 40, 45 Horse Power Ratings
Limousines, Touring Cars, Coupes and Roadsters
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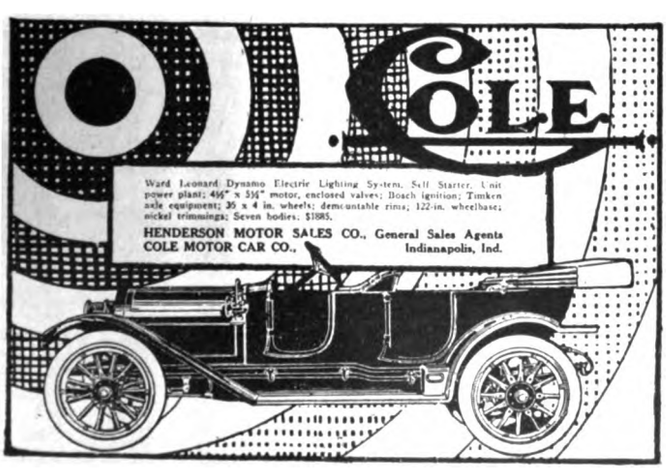
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Has more Horsepower and a longer Wheel Base than any other Four Cylinder Automobile in the World selling for this price $1850

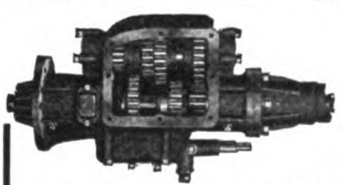
Send for our Chart of Comparative Motor Car Values

Clarke-Carter Automobile Company
Jackson, Mich.





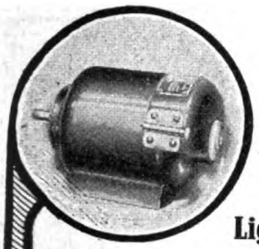
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will help bring your car to the standard of efficiency that you are working for. Every gear shaft and bearing is made of nickel steel, heat treated and accurately ground. All material and workmanship is guaranteed. Will be glad to talk with you about them.

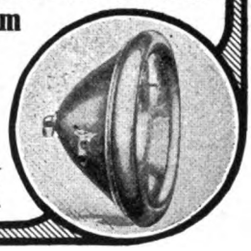
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HAVERS SIX — HAVERS MOTOR CAR CO.

Havers Self-Starting "Six-44"



Price $1850

SPECIFICATIONS TALK—Six-cylinder Motor, 4-cycle long-stroke type; 44 H. P.; Bosch Magneto; dual system; Model "C" Stromberg Carburetor. 122-inch wheel-base; 36x4-inch wheels; self starter. Springs, semi-elliptic front, platform suspension, rear; rear axle, full floating type.

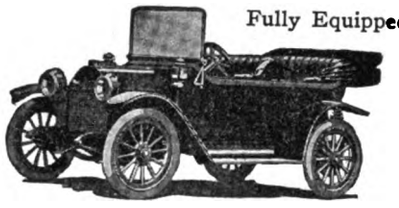
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Fully Equipped

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25 H. P. Long Stroke Motor

Enclosed Valves, Three Point Suspension, Unit Power Plant, Platform Rear Springs, Full Floating Axle, Left Hand Drive, Center Control, Drop Frame, Large Tires, Complete Ball Bearing Car. Write for specifications.

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Complete Equipment
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The first American Car to adopt the Silent Knight Motor—the Engine used by Daimler Mercedes, Panhard and Minerva

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Pullman cars are not sold to dealers because of enormous dealers' commissions—but because Pullman dealers have no trouble in selling Pullman cars at list prices. The purchaser gets the greatest value possible for the money—the dealer gets a good, fair profit. Results—both customer and dealer satisfied.

Four different size motors—3 four cylinder, 1 six cylinder—with a variety of body styles. Self cranking, electric lighting device, full equipment.

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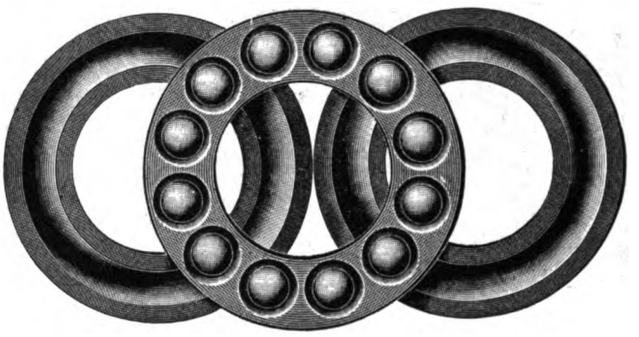
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ALWAYS READY AND POSITIVE

The AMERICAN STARTER is the Only Starter on the market that measures the amount of gas injected into the cylinders. You cannot "dope" the engine with the AMERICAN STARTER.

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Price $3.50 With Decarbonizer High Power Models Upward

It will save you 20 per cent. in gasoline, increase power of motor 20 per cent. and is a positive preventive of carbonization.

How It Works—SPEEDO breaks up, under spray, each particle of gas after leaving carburetor, injecting additional air, automatically. Makes easy cold weather starting and is sold only Under Guarantee of Absolute Satisfaction. Ask your dealer.

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INVINCIBLE STARTER

will start any four-cycle engine of four or six cylinders. Turn on the switch—that's all.

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Gas Controller and Igniter

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Without Cylinder Attachments

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By adding an injector and cylinder attachments the crankless starter becomes absolutely perfect—100% efficient. For 4 cylinders the extra attachment costs $10, for 6 cylinders, $15.

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The Motor With the Sliding Crescent Valve

KNIGHT-DAVIDSON
1896 — 1912

The CRESCENT valve of the K-D Motor, fitting around the stationary piston wall affords a larger port area than any other poppet or slide valve on the market. It is simpler and, consequently, better than any other valve construction known and is here offered to discriminating manufacturers, not as an experiment, but as a tried, tested and proved mechanical advance. The K-D motor is simple, silent, cools rapidly, has the simplest oiling system known, will not carbonize. Last and most important, will give on a given quantity of fuel more power, speed and endurance, unit for unit, than any other engine on any type of an automobile. We want to present some facts to interested manufacturers.

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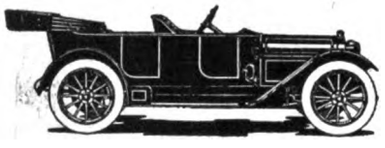
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SPECIAL METAL STAMPINGS

Mighty Michigan Forty

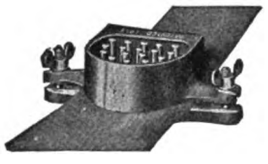


40-Horsepower Touring Car or Roadster, absolutely silent in operation. Cylinders 4¼ x 5¼-in. — 116-in. wheelbase—34 x 4-in. tires—demountable rims—nickel mountings—massive, straight line body—big, roomy seats—proved self-starter—everything. Price $1500. Guaranteed for life by the Michigan Buggy Company. 40-horsepower Roadster on the same chassis. Two smaller models. Catalog on request. (83)

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TIRE CUTS ruin casings. They admit moisture to the carcass, cause the fabric to rot and weaken, grow larger—end in blowouts.

You can repair **CASINGS** and **INNER TUBES** anywhere in 15 minutes, better than a Repair Shop can do —and for *one cent.*

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Patented

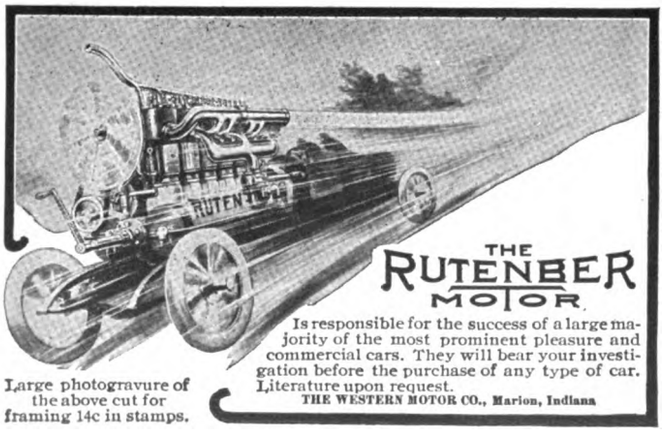
A practical vulcanizing outfit complete, with enough repair gum to make 40 patches. It weighs 3 pounds and can be carried in the tool box. **Simplest and most satisfactory device for eliminating tire troubles that has ever been devised.**

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Price Complete, **$4.00** Ready for Instant Use
Guaranteed Satisfactory or Money Refunded

ADAMSON MFG. COMPANY, East Palestine, Ohio



THE RUTENBER MOTOR

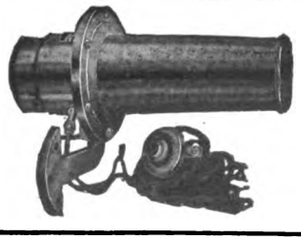
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Are unreservedly guaranteed wherever sold. If your dealer does not carry the "Newtone" let us send one on approval

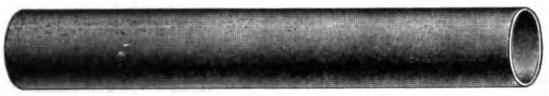


Torpedo Type
Price $20

Automobile Supply Mfg. Co.
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All sizes from 1 inch to 3 1-4 inches diameter cored and solid bars kept in stock for immediate shipment. Order by wire. We will ship by express.

Specify PARSONS' WHITE BRASS for main and crank pin bearings. CRAMP'S SPECIAL BEARING BRONZE for wrist pin bearings.

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Ignition Absolutely Sure

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Also Makers of **RAJAH TERMINALS**- the Best Made

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We could build them cheaper
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The sharp edges of the grooved roller cut through grease and other obstructions, and positive contact is guaranteed at all points every revolution. Double ball bearings minimize wear and prevent wobbling. Will increase the efficiency of your motor 10 to 20 per cent.

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Safe **Efficient**
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A SPRING starter of Simple Perfection, ABSOLUTELY AUTOMATIC action and FULLY GUARANTEED.

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4 Cylinder 35 H. P. $4500; 6 Cylinder 50 H. P. $5500
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DAYTON TRUCKS are made in 2, 3 and 5 ton models. They hold a world's record for durability, reliability and efficiency. Write for catalog.

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The Motor Lamps with Distinctive Features

There are no other motor lamps on the market with the advantages of Solar Lamps. Solars are always exclusive in style and in quality. They are the strongest lamps as well as the most effective.

In no other lamps can you obtain the Solar Special Short Focus Lead Glass Lens Mirror Reflector—the patented system of double ray light projection which gives two distinct fields of light for town and country use—or the new and exclusive black finish with a metallic lustre which is unaffected by heat or moisture. All of these features are exclusively "Solar."

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Solars are made in all styles for oil, electricity, gas and in combinations.

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Drop Hammer Forgings

cost very little more than castings. They are vastly superior and less expensive in the end.

WE ARE SPECIALISTS
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from special analysis steel.

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QUALITY AND SERVICE GUARANTEED
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Abbott-Detroit 1912 MODELS

MODEL "44"

Seven Passenger, Fore-door Touring Car, fully equipped, less top, windshield and extra seats	$1800
Fore-door Demi-Tonneau, fully equipped, less top and windshield	1775
Fore-door Limousine, fully equipped	3000

MODEL "36"

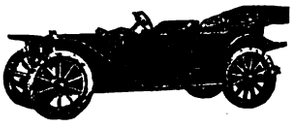
Fore-door Touring Car, fully equipped, less top and windshield	$1350
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SOLD EVERYWHERE **SHAWMUT TIRE CO., Boston, Mass.**

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AMERICAN MOTORS CO., Indianapolis, Ind.
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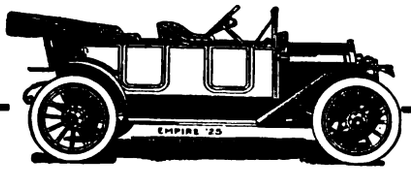
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Our Banner Year

At the close of the best year in the long history of this company, we want every Winton Six buyer to know that we appreciate his patronage and that, as the years go on, we hope always to be deserving of his continued patronage.

THE WINTON MOTOR CAR CO.
426 Berea Road **Cleveland, O.**

Shall we put your name on the list for 1913 catalog, shortly to be issued?



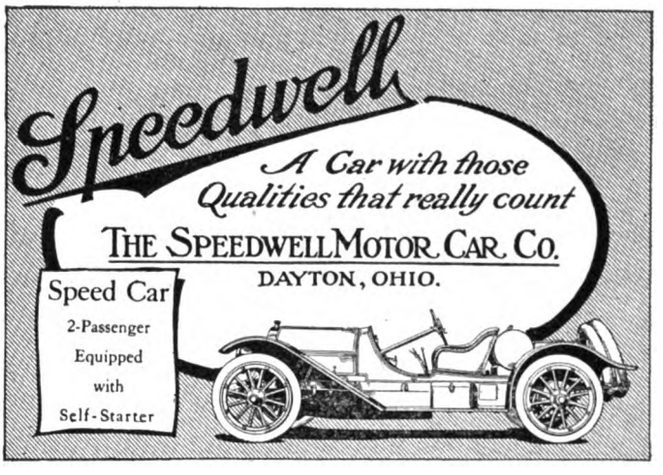
Empire Twenty-Five

"The Little Aristocrat"

This is the Big Brother of the Famous Empire Roadster and is a **small edition** of $5,000 cars.

Hence the price of $850 puts this car in a class by itself. Specifications prove the Empire 25 to be the most "aristocratic" little touring car in America. Write for details today.

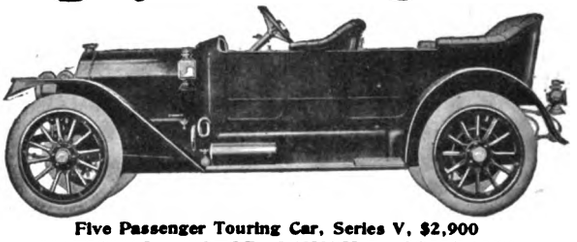
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Stock Champion **International Champion**

National 40



Five Passenger Touring Car, Series V, $2,900

NATIONAL MOTOR VEHICLE COMPANY
1007 E. 22nd Street **Indianapolis, Ind.**

They Barred the Franklin Out

The Quaker City Motor Club of Philadelphia conducted an economy run for motor cars April 27, open to all pleasure cars with the exception of air-cooled cars.

What They Did

In the Quaker City contest, open only to water-cooled cars, first prize for economy was awarded to a two-passenger car that averaged 22.7 miles per gallon of gasoline.

What the Franklin Has Done

46.1 miles on one gallon of gasoline in the economy contest conducted by the Automobile Club of Buffalo.

87 miles on two gallons of gasoline in the economy run held by the Automobile Club of America.

FRANKLIN AUTOMOBILE COMPANY, Syracuse, N. Y.

Hupmobile

Long-Stroke "32"
Touring Car
$900 F. O. B. Detroit

Motor 3¼ x 5½ inches; four cylinders; Bosch magneto; three speed sliding gears; tires 32 x 3½ inches; 106 inch wheelbase. Equipment includes windshield, gas headlights, generator, oil lamps, tools and tire repair kit.

Roadster body on same chassis and with same equipment, $900 F. O. B. Detroit.

20 H. P. Models

Runabout—$750
F. O. B. Detroit. Same power plant as World-Touring Car. Wheelbase, 86 inches. Equipment of top, windshield, gas lamps and generator, oil lamps, horn and tools.

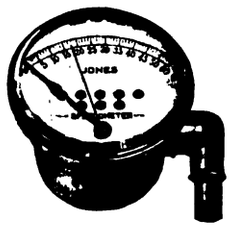
Roadster—$850
F. O. B. Detroit. Same chassis and power plant as World-Touring Car. Wheelbase, 110 inches. Same equipment as Runabout, also highly finished steel box on rear deck for tools and accessories.

Coupe—$1100
F. O. B. Detroit. Same power plant as World-Touring Car. Wheelbase, 86 inches. Electric headlights, electric and oil side and tail lamps, folding dash seat for third person. Rear tires, 31 x 3½ inches. With 110 inch wheelbase, $1150.

HUPP MOTOR CAR CO., 1254 Milwaukee Ave., Detroit, Mich.

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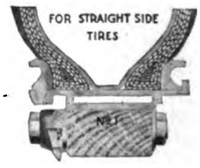


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Cleveland, Ohio

Standard Universal Rims



fit any style or make of tires. The side rings are reversible, they curve outward on one side to fit a straight side tire, inward on the other to accommodate a clincher. Two turns of a nut unlocks the rim for demounting, two more turns locks the rim in place. Write for catalog 607, which explains fully.



THE UNITED RIM COMPANY, Akron, Ohio

Repair Parts For MORA Transmissions

We have in stock all parts for the transmissions of MORA automobiles. Write us for prices on any parts you may require and save money over having them made up special.

The NEW PROCESS N.P.R.H. RAW HIDE Co.
OFFICE & WORKS SYRACUSE, N.Y.
REG. U.S. PAT. OFF.

DUPLEX EXTERNAL BRAKES

Act Instantly—Forward or Backward

Duplex brakes produce maximum safety. They are America's leading brakes. Made by brake experts. Nothing so necessary as "quick acting" brakes.

Get a set of DUPLEX brakes. Inexpensive—easily installed. We build brakes to order. Write us today. Let us quote prices. Send for complete catalog.



THE ROYAL EQUIPMENT COMPANY
436 Housatonic Ave. Bridgeport, Conn.
Manufacturers of Raymond Brakes, Raybestos Brake Lining and Gyrex—The Mixer.

AUTOMOBILE OWNERS AND TOURISTS

should break their journey and avail themselves of the excellent facilities afforded by the D. & C. Lake Lines, operating daily service between Detroit and Buffalo and Detroit and Cleveland.

Enjay the delights of the cool breezes from Lake Erie and resume your journey in the morning after a refreshing night's rest. Special attention given by this Company to the handling of automobiles. Rates quoted on application (state wheel base); Tanks of Automobiles must be emptied of gasoline before being shipped; three gallons of gasoline supplied free on arrival at destination.

Roads in this section of the country are in first class condition; new road now under construction between Detroit and Toledo. Tourists speak highly of the route between Buffalo and New York.

On your trip this summer bear in mind "The Waterway is The Only Way."

DETROIT & CLEVELAND NAVIGATION CO.,
General Offices, Detroit.

If you are interested in

FEDDERS RADIATORS

we would like to send our latest catalogue.

Fedders Manufacturing Works
57-67 Tonawanda St. BUFFALO, N. Y.

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THE NAME
of this new signal will be announced in

The Automobile - -	July 25
Automobile Topics -	July 27
Horseless Age - - -	July 24
Motor Age - - - -	July 25
Motor World - - -	July 25
Motor Print - - -	August

Contestants will be notified individually by mail as soon as decision is made.



$100 to be awarded July 15

If you have not already sent in your suggestions you yet have time to do so and win $100. Send in as many names as you wish to reach us before July 15. Mark envelope "Name Contest" and address to Lovell-McConnell Mfg. Co., 207 Wright St., Newark, N. J.

(Be sure to include street address.)

THE SIGNAL ITSELF will be the first *motor-driven* signal ever sold at a low price.

It operates on the same principle as the Klaxon and Klaxonet—is thoroughly well made and reliable—and will be sold under the regular Klaxon guarantee—for **$12**

Deliveries will not be made until September 1.
Orders will not be accepted prior to August 15.



KLAXONET

Lovell-McConnell Mfg Company Newark, N.J., U.S.A.

KLAXON

"The Public Safety Signal"



KLAXON

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Studebaker

The $800 Studebaker-Flanders "20"

The Studebaker-Flanders "20" has a tremendous price advantage.

No other car, offering as much value approaches its price.

Think for a moment what you get when you buy a Studebaker "20."

It is a real car, modern throughout in design and construction, large enough, and so powerful that you will never find road conditions in which your Studebaker "20" cannot spin its wheels.

The motor is a marvel, very speedy, quick to pick up, flexible, the kind of a motor a driver grows to like and have full confidence in.

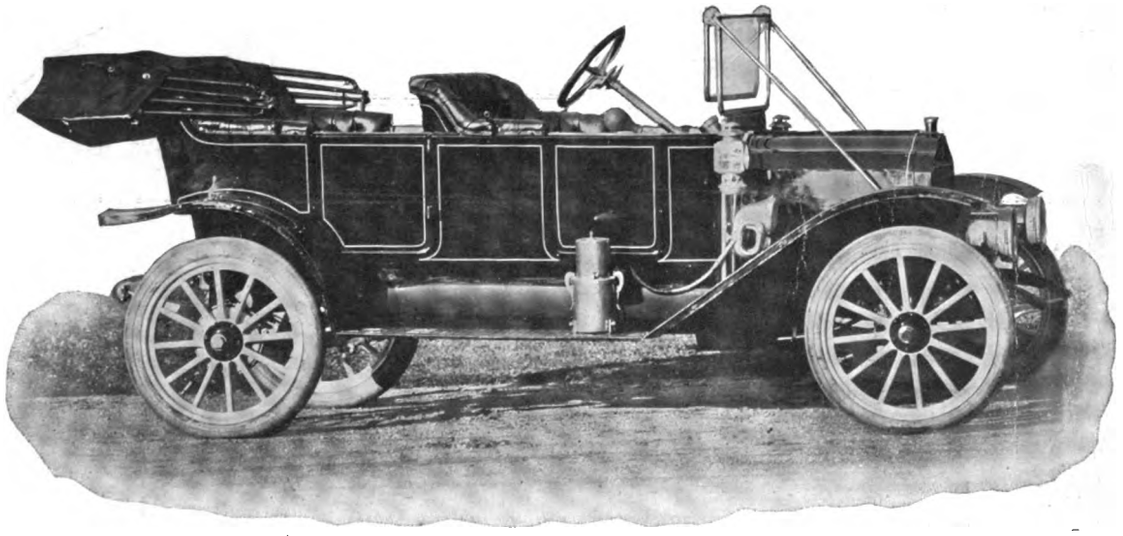
The Studebaker "20" transmission system is of the standard three speed type, any car speed you wish up to 55 miles an hour. The rear axle is remarkably well designed and built, giving the best of service.

Every Studebaker "20" body gets 17 coats of paint and varnish, which are properly rubbed and aged. If you take care of your car, your Studebaker body will equal any automobile body on the market.

These are some obvious points which show the car's value.

But the deeper you go into the design and manufacture of the Studebaker "20" the better you will like it. We watch every detail.

Every Studebaker "20" is built not only for the first mile but for the 20,000th mile. In those qualities which make for endurance and lasting satisfaction, the Studebaker "20" is incomparably first. Why? Because it is Studebaker-built, and Studebaker always builds that way.



Studebaker-Flanders "20" Touring Car, $800, f. o. b. Detroit.
Equipped, as above, with Top, Windshield, Prest-O-Lite Tank and Speedometer, $885.

ASK OUR DEALER FOR THE NEW STUDEBAKER
ART CATALOG OR SEND TO US FOR IT.

The Studebaker Corporation

Detroit, Michigan

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THE MOTOR WORLD

A Trade Paper Giving the World's Motor News

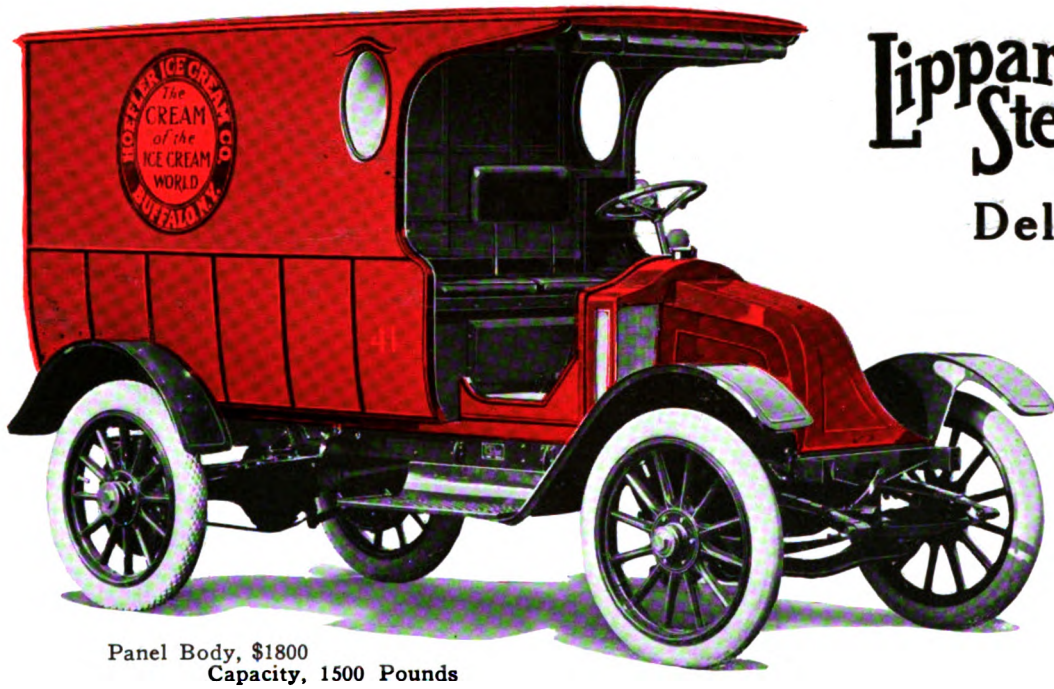
Vol. XXXII
No. 4

New York, July 18, 1912

Ten cents a copy
Two dollars a year



Published Weekly by The Motor World Publishing Company, 1600 Broadway, New York



Panel Body, $1800
Capacity, 1500 Pounds

Lippard-Stewart

Delivery Cars

Panel Body . .	$1800
Express Body with Top	$1775
Open Box Body,	$1775
Stake Body . .	$1775
Police Patrol . .	$2325
Ambulance . .	$2325
Hotel Bus . . .	$2325

Sell Delivery Cars That Merchants Want. Live Dealers Find Ready Market For Lippard-Stewart Cars.

LIPPARD-STEWART commercial vehicles are classed by experts as "the best dollar-for-dollar delivery cars on the market. They are built after careful investigation of the needs of merchants in all lines of business, big and little, and with particular attention to the points which were brought out by actual talk with tradesmen and manufacturers, as being desirable or undesirable in a commercial car.

We believe that a car built as this has been, by careful engineers considering the users' problems as well as the manufacturers', is sure to meet the complete approval of all its users. These cars have been subjected to the most strenuous tests in actual service and have proved themselves to be ideal for all purposes.

The many features which commend Lippard-Stewart delivery cars to the careful consideration of all prospective buyers of delivery cars are:

Four-cylinder Monobloc Motor, long stroke, slow speed, 22 h.p., five to one gear ratio in rear axle.

Selective Transmission. Vanadium steel heat-treated gears. 1-inch face.

Multiple Disc Clutch. Steel and Raybestos discs. Clutch case integral with transmission.

Special Timken Rear Axle. Full-floating type; 17-inch brake, 34-inch wheels.

Bosch magneto, single ignition. No batteries, timer, coil, etc.

Thermo Syphon Cooling. No water pump and connections.

Special Spring Suspension. Full elliptic in front, long semi-elliptic and auxiliary coil springs in rear.

Every Part Accessible. Each unit can be removed, if necessary, without disturbing any other unit or the load.

Left-Hand Steering. Levers in center at driver's right hand.

Handsome Lines, Beautiful Finish. A Lippard-Stewart car is a constant advertisement for the owner. It shows that he is progressive and up-to-date.

Lippard-Stewart delivery cars have no seasons or weather conditions. They are at the owner's service twenty-four hours a day, if necessary, and can be depended on for rush work at any time. They out-work the best possible horse delivery at much lower cast and save money at every point.

An Opportunity for You

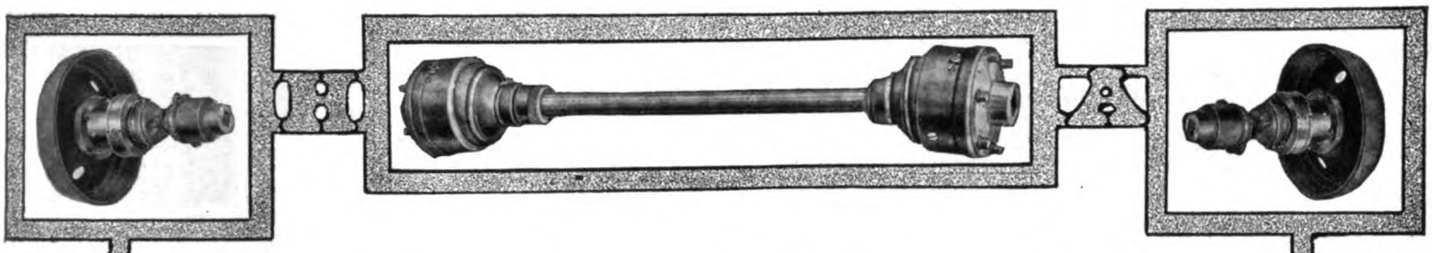
We have openings for a few more dealers. Perhaps yours is a town in which we are not yet represented. At any rate, it will do you no harm to find out. Write for our proposition to dealers and let us show you the money-making possibilities of handling the Lippard-Stewart line.

You will get some valuable information by just seeing the Lippard-Stewart commercial vehicles. Let us show you these cars at our salesrooms and help you get what you need.

LIPPARD-STEWART MOTOR CAR CO., Buffalo, N. Y.

AUGUST BECKER, President — E. J. BARCALO, Treasurer — J. C. MILLAR, Secretary
C. S. DAHLQUIST, Chief Engineer — W. F. REYNOLDS, Sales Manager

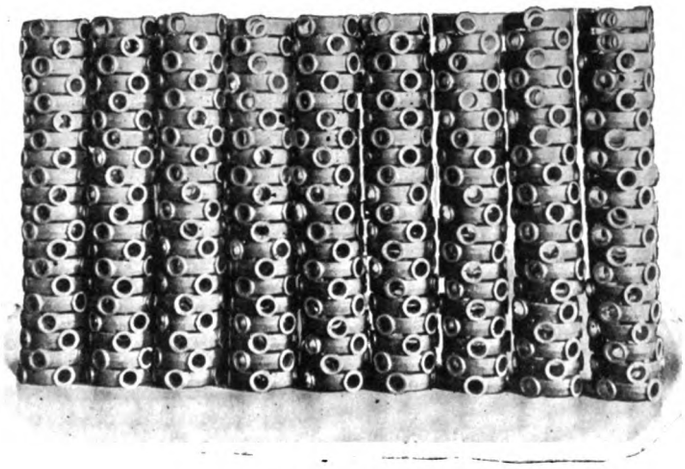
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A concern such as this must exist and enlarge on its ability to produce clutches and universal joints that will stand the expert scrutiny of automobile engineering experts.

That we are building such parts is self evident—because new business is coming to us and old business is sticking.

Hartford clutches and drives are standard on many of America's leading cars. 1913 will see still further enlargement.



F-400 BEARINGS RINGS
Made from 25 Carbon Steel Forgings

We show here a picture of one of the scores of stacks made up of finished universal parts—and our factory floors are loaded to their limit with these disassembled parts awaiting collection and shipment.

Surely this is a sign of healthy business—one built only on the advertising that comes with good reputation.

We want to put Hartford quality parts on still more quality cars—and the first order from a new customer will prove—

Right products at the right price at the right time.

Between seasons is the time to get in touch with the parts people—and that time is now.

J. S. BRETZ CO.. New York, Detroit, Sole Selling Agents.

CONE CLUTCHES

HARTFORD AUTO PARTS CO.
HARTFORD, CONN.

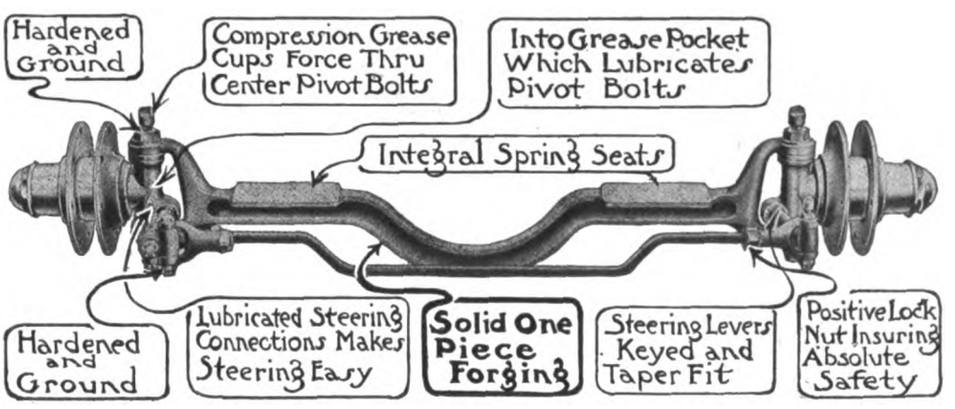
UNIVERSAL JOINTS

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EXPERIENCE – SHELDON – RIGHT DESIGN
FACILITIES – AXLES – RIGHT STEEL

"Made in the Largest Axle Factory in the World"

Axle Talk—No. XI



The car that bears as one of the specifications, SHELDON axles, is a car that can be safely relied on to embody quality in its other parts.

We believe that the average car manufacturer is willing to pay for quality—at least we have found it so in our particular business, for SHELDON axles are not by any means the cheapest—and yet when the price is considered along with the service rendered, they are in the end the most economical for the ultimate user.

We again call attention to the pronounced special features characterizing the SHELDON front axle as illustrated here, with particular reference to the fact that these axles are drop forged from end to end—that even the spring seats are parts of the original bar of steel.

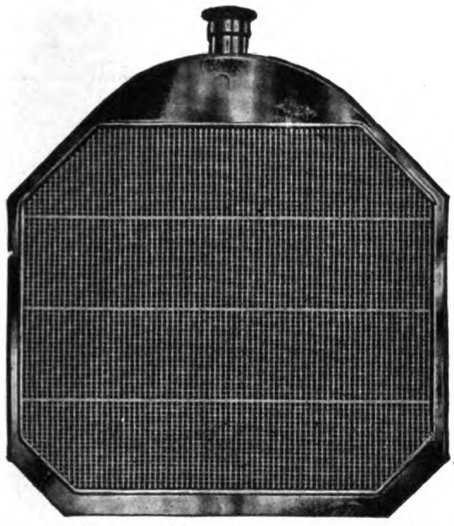
Design, material and manufacture all unite in forming SHELDON standard—a standard that is known wherever cars are known.

Our Engineering Department stands ready to co-operate with you, Mr. Car Manufacturer, in the matter of putting the right kind of axles on the right kind of pleasure cars and commercial trucks.

SHELDON AXLE COMPANY, Wilkes-Barre, Pa.

CHICAGO OFFICE—68 East 12th St. DETROIT OFFICE—1215 Woodward Ave.

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The Mayo—the radiator thoroughbred

¶ Long experience, modern facilities, our own original ideas and careful selection of materials have produced the one perfect radiator—the MAYO.

¶ It isn't all in materials, it's knowing how to assemble them. That makes for high efficiency in operation—MAYO efficiency.

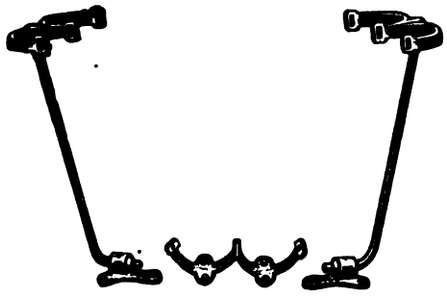
¶ Let the name guide you right.

Mayo Radiator Company
NEW HAVEN, CONNECTICUT

The Largest Automobile Supply House in America

FIFTEEN STORES IN THE UNITED STATES

"Torpedo" Tire and Demountable Rim Holders



Designed especially for use on Torpedo body or Fore-door cars. Set consists of two strong arms firmly bolted to running board and permitting of sufficient adjustment to accommodate two tires or demountable rims, of standard sizes, 4 inch or smaller. Made of solid Brass and guaranteed to give perfect satisfaction.

Finish: Furnished in Hard Rubber Black Enamel finish, and full Polished Brass.

	Brass	Black
Price, complete with Straps...	$4.00	$3.00

A dozen other styles and sizes in stock. See catalog.

Our 1912 Catalog, which is held as a book of reference by manufacturers, dealers and automobile owners, will be mailed on request. Circulation limited to 100,000 copies.

Chas. E. Miller

MANUFACTURER, JOBBER, EXPORTER AND IMPORTER

HOME OFFICE

97-99-101-103 Reade St., New York City

ORDER FROM NEAREST BRANCH, ADDRESS CHAS. E. MILLER

NEW YORK CITY—97-103 Reade St.
NEW YORK CITY—924 Eighth Ave.
NEW YORK CITY—2782 Broadway.
BUFFALO, N. Y.—824 Main St.
BROOKLYN, N. Y.—1421 Bedford Ave.
ALBANY, N. Y.—135 Central Ave.
BOSTON, MASS.—202-204 Columbus Ave.
HARTFORD, CONN.—274 Trumbull St.
DETROIT, MICH.—227-229 Jefferson Ave.
CLEVELAND, OHIO—1829 Euclid Ave.
PHILADELPHIA, PA.—318 North Broad St.
ATLANTA, GA.—66 Edgewood Ave.
NEW ORLEANS, LA.—601-603 Barrone St.
NEWARK, N. J.—274 Halsey St.
SPRINGFIELD, MASS.—Bridge and Dwight Sts.

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Costs little to Buy



Costs Nothing to Operate

It Never Fails

$18.

THE LONG HORN

$18.

You Can Make the Warning as Loud or as Soft as You Wish

There is no signal on the market, electric, exhaust, or otherwise, which is the equal of the Long Horn for use on an automobile.

In the first place the Long Horn will never fail—just so surely as you press the button you issue a warning—loud and long, if you wish it—or soft and short, if you wish it. The volume of tone depends upon how hard you press the button.

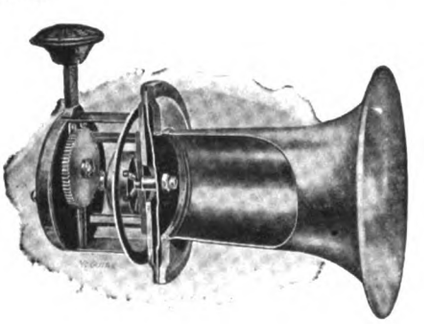
The Long Horn Is Not an Electric Horn

It is the superior of any electric horn made even when that electric horn is working, and yet it costs only about one-third as much as the best electric horn.

The Long Horn eliminates all chance of failure found in all other horns, such as the breaking down of the motors, running down of the batteries, cracking of bulbs, etc.

Certainly, the Long Horn offers a mighty attractive proposition to dealers everywhere if those dealers are live enough to push the leader of all warning devices.

If Long Horns are not already represented in your territory, why don't you write us at once. It will be to your interest.



PHILADELPHIA, 1416 Vine St.
BOSTON, 109 Massachusetts Ave.
MINNEAPOLIS, 70 So. 10th St.

BUFFALO, 852 Main St.
SAN FRANCISCO, 544 Van Ness Ave.
LOS ANGELES, 1229 So. Olive St.

SEATTLE, 917 E. Pike St.
PORTLAND (ORE.), 329 Ankeny St.
DENVER, 15th and Curtis Sts.

The G Piel Company 13TH STREET & BOULEVARD LONG ISLAND CITY

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"45"—$1400

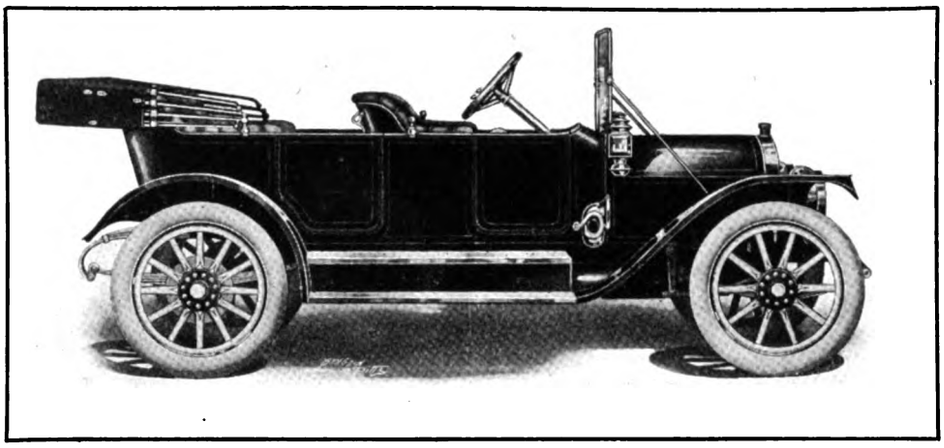
PENN CARS

"30"—$1000

The average dealer wants a line that appeals to PURCHASERS. The PENN line does that. Value dominates each model.

BY EVERY TEST of performance, the PENN car is the only one that satisfies the greatest number of requirements—it does everything that can be done with any car—goes where ANY CAR CAN GO, and at a lower cost. PENN cars have a distinctive style of their own—the two chasses being equipped with beautifully modeled bodies of various types, all of them perfect bits of body-builders' art—wherein the perfection of line and the beauty of workmanship are everywhere apparent. The bodies are as perfect in their classes as the chasses are in theirs—the kinds that, while pleasing the eye with their graceful lines, one remembers longest for their comfort and convenience.

Model "T-4"



30-H.P. $1100

The most we can hope from this advertisement is to get you to look at the PENN cars and to have you compare them. But don't limit your comparison. Compare them with cars costing more.

THE PENN TWO PASSENGER FORE-DOOR ROADSTER	30-h. p.,	$1000
THE PENN TOURING CAR	30-h. p.,	1100
THE PENN "PIRATE" ROADSTER	45-h. p.,	1350
THE PENN TOURING CAR, FIVE-PASSENGER	45-h. p.,	1400

The PENN 45 touring car is the most and the best that $1400 ever bought. It's a large, roomy, luxurious five-passenger car, wheel base 115 inches and 34-inch wheels, 45 horse power motor, annular ball bearing transmission. This car belongs to the $3000 class, body, design, equipment, upholstery—all the very best that money can produce.

Dealers Wanted in Unoccupied Territory

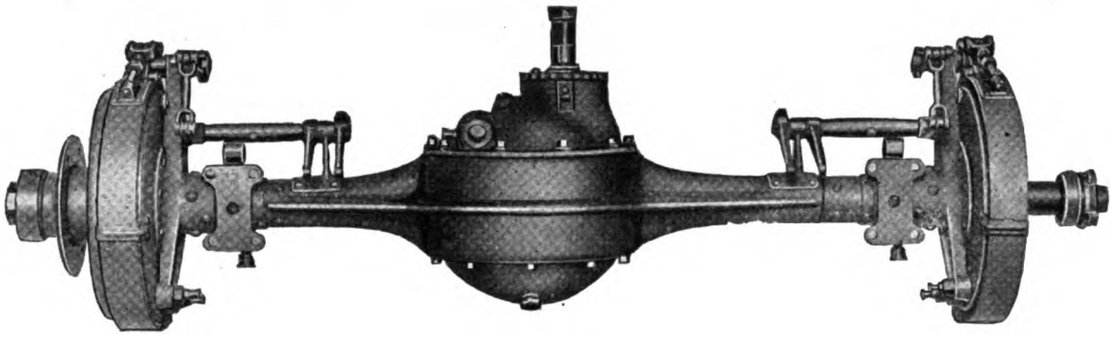
PENN MOTOR CAR COMPANY, New Castle, Pa.

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American American

American Axles

Poor Axles Will Rob Your Electric's Batteries



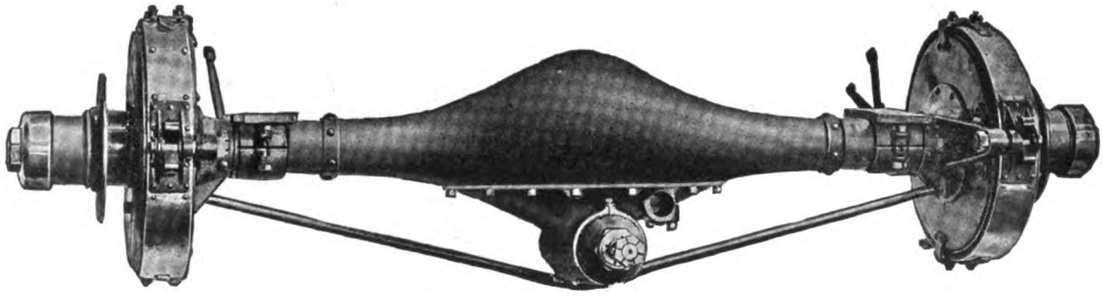
Do you know that the amount of service your battery gives is based squarely upon the quality of your axles?

Do you know that the more current used to overcome mechanical difficulties, the less remains for motive power?

Do you know that *American Axles*, with their patented features ensuring easy running, are of tremendous importance in securing maximum mileage?

We designed and manufactured the first successful Bevel Drive axle suitable for use in electric vehicles, giving it the refinement demanded for this exacting service.

We also build the famous Lanchester-Daimler Worm Gear axle, holding the exclusive American rights as axle manufacturers through the Warner Gear Company, of Muncie, Ind.



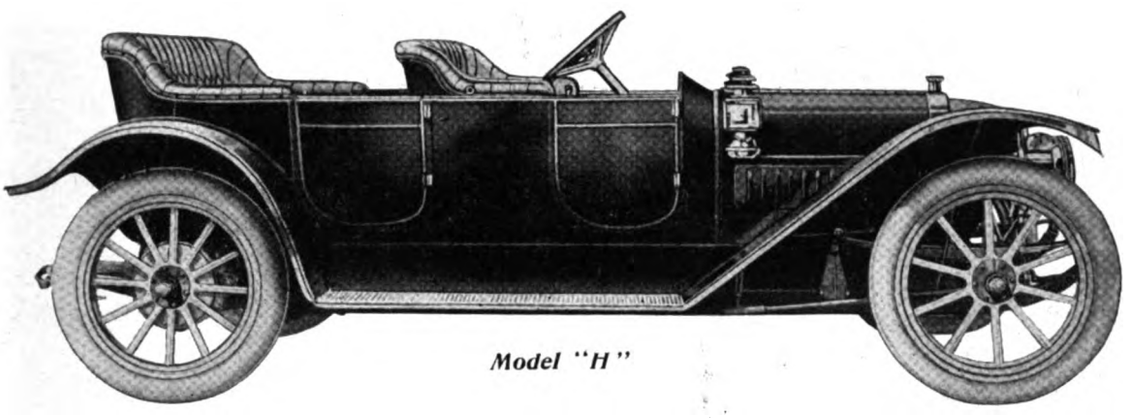
THE AMERICAN BALL-BEARING CO.

Edgewater Park and L. S. & M. S. Ry. CLEVELAND, OHIO

American

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The True Meaning of the Word "Service"



Model "H"

The Regal "35" Underslung Touring Car, $1400

A MUCH ABUSED WORD—is this word "Service." In a hundred pieces of publicity you will see it used indiscriminately, unrelated to its true meaning as it affects the dealer and the purchaser of Motor Cars. Used as a stop-gap for lack of something to say—merely to fill out space, as if the writers of automobile "copy" were brain fagged and needed a prop, a support for the re-arrangement of their wearisome, reiterated adjectives.

THE WORD "SERVICE" has several meanings in its relation to the building and marketing of automobiles, all of which are co-related and apply on one perfect service that by right is demanded by dealer and purchaser today, but any one of these meanings, applied separately, reduces the true meaning of the word to a commonplace, of very little advantage, if any, to dealers or the public they serve.

WHAT IT DOESN'T MEAN. Service doesn't mean that a dealer who sells a car is responsible for its quality, for its design, for its monetary fair value. Service doesn't mean that because a dealer sells a certain car he therefore guarantees it against defective material, or the breaking of parts through excessive stress or abuse. Service doesn't mean that should accident happen the owner has to wait days, or weeks, for parts necessary to effective repair. Service doesn't mean that when a car is purchased the transaction between seller and buyer is ended. Service doesn't mean that because a manufacturer happens to have a few hundred dealers, or less, scattered over the country, the owners of that particular make of car are protected against inefficiency.

SERVICE TRULY MEANS the opposite of all these opinions or beliefs. It means a manufacturer behind the dealer, who guarantees his cars, qualities, designs and just values. It means protecting the purchaser direct against defective material and the immediate supply of parts broken by accident or abuse. It means a factory, that through its each and every dealer is vitally interested, always, in the efficient performance of every car in the hands of owners. It means, also, a perfect organization to guarantee the true expression of the word "Service."

THIS IS REGAL SERVICE. A co-partnership that makes for the dealer the selling of Regal cars a pleasure instead of drudgery. A business-building service, for it creates satisfied customers. REGAL SERVICE WAREHOUSES are placed at strategic points all over the country. They carry complete stocks of cars and parts for immediate delivery. They are really dealers' warehouses and guarantees to owners of Regal cars for the highest efficiency of every Regal car in service. These warehouses prevent delay and vexing annoyance. They give a greater value to every Regal car sold than can possibly be included in the purchase price.

THE REGAL "35" UNDERSLUNG TOURING CAR is not only a car inbuilt with the most advanced engineering practice in design, but is also one of the distinctive Regal family of "Underslungs" behind which is the Regal Perfect Service. A car that completes the Regal Comprehensive Line, giving every Regal dealer an opportunity of sale, for there is a Regal car for every purchaser's preference, ranging in price from $900 to this beautiful, roomy, powerful Underslung at $1400. Because the Regal line is a year ahead in construction, because Regal cars are more than moderate in price, excelling in quality and values, and because Regal Service is behind and offered free with every Regal car—it pays to be a Regal dealer —because it pays in economy and efficiency to be a Regal owner.

SOME SPECIFICATIOINS. Motor, 35 H. P., 4 cylinders (in pairs) 4¼ x 4½; wheel base 118 inches; Morgan & Wright tires, 34 x 4; demountable rims (one extra furnished free of charge); three speeds and reverse, selective sliding transmission. Hyatt nickel steel roller bearings. Dual ignition with magneto—standard equipment—two gas searchlights, two side oil lamps—tail lamp, generator, tools, jack, pump, etc.

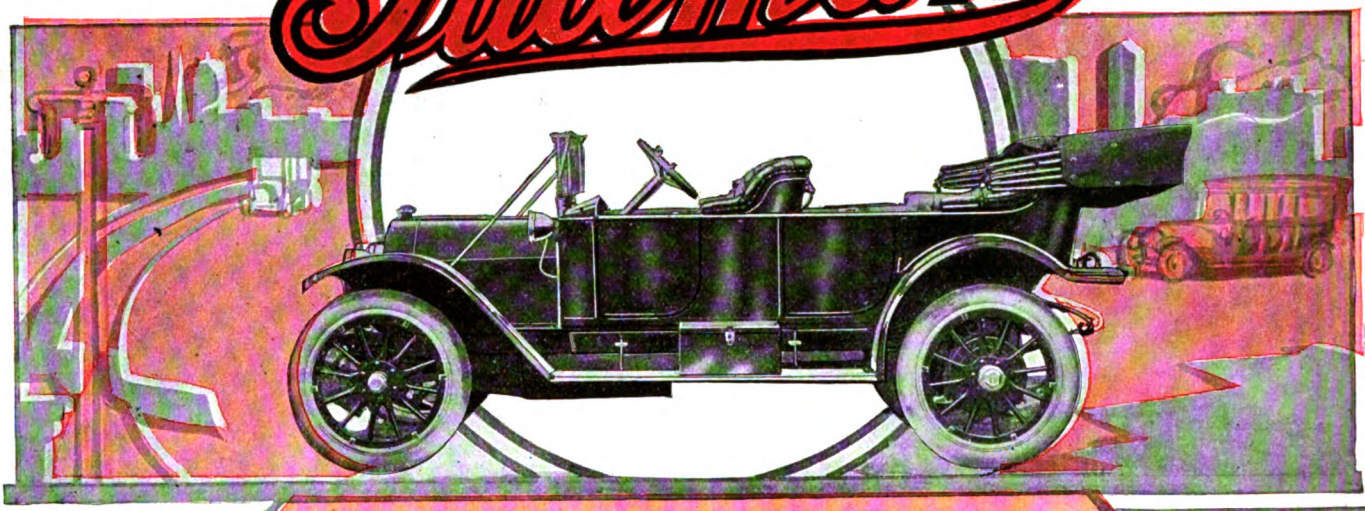
OTHER REGAL CARS WITH REGAL SERVICE. The most advanced construction, lowest price, highest quality car for 1912—the New Regal "25" Underslung Touring Car, $950. The famous (biggest seller) Regal "25" Underslung Roadster, $900. The Regal "25" Underslung Colonial Coupe, $1250.

The Regal Motor Car Company AUTOMOBILE MANUFACTURERS **Detroit, Michigan**

FOREIGN DEPARTMENT—18 Broadway, New York

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1913 Pullman 1913



Pullman

Built for Service

Pullman

FOR 1913 the Pullman Motor Car Company offers the Pullman 4-36; Pullman 4-44; Pullman 6-66. These three models compare very closely with the three leading models for 1912. The changes in design are largely confined to refinement of details, increase of power and fuel capacity.

The radiators have all been enlarged in capacity, the oil reservoir on the larger models has been considerably increased in size, as have also the fly wheel and clutch. The steering wheel has been made larger in diameter on all models and both the front and rear springs have been considerably lengthened.

In addition to this there has been a general addition to the equipment to such an extent that there is nothing left for the owner to buy to make the equipment of his car absolutely complete.

The 4-36 motor is 4 1-16 inch bore by 5 inch stroke, with cylinders cast in pairs and exceptional large valves 2⅛ inches in diameter. All of the parts and accessories are standard and accepted leaders. This model comes in six different body styles, from a roadster through the various modifications to the limousine. The retail price of the regular five passenger 4-36 is $1675.

The 4-44 motor is 4½ inch bore by 5½ inch stroke, with cylinders cast in pairs, large valves, with its rated horsepower developed at only 1300 r. p. m. This model carries four speeds forward and one reverse. The wheel base is 122 inches. The body comes in seven different styles with the regular stock body and equipment priced at $2150. This model, in addition to being equipped with a self-cranking motor, carries a complete electric lighting outfit.

The Pullman 6-66 motor consists of six vertical cylinders, 4½ inch bore by 5½ inch stroke, cylinders cast in pairs, with its rated horsepower developed at only 1300 r. p. m. This model carries four speeds forward and one reverse and has a wheel base of 138 inches. In addition to the motor being self-cranking, this model is also equipped with a complete electric lighting outfit. Price of this model with regular body is $2750.

"THE PALACE CAR OF THE ROAD"

PULLMAN MOTOR CAR CO., York, Pa.

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1913 Pullman 1913



Pullman

They Lead the Leaders

Pullman

THESE specifications cited here of course are very meager, serving only to indicate the general outlines of each of the leading models for 1913. Full detail specifications will gladly be furnished upon application.

We wish to impress thoroughly upon the trade that all Pullman cars are manufactured by the Pullman Company and not assembled. As stated above, the accessories, such as carburetors, magneto, batteries, bearings, etc., are all manufactured by the accepted leaders in the industry.

No car manufactured at any price is more carefully built than the Pullman. The factory work is as fine and exhaustive as it is possible for skilled mechanics to produce.

What the Pullman Motor Car Company wishes most thoroughly to impress upon dealers throughout the country is the fact that it is looking only for representation of the highest order. The Pullman product is an asset to the dealer only because of its intrinsic merits—not because of excessive commissions and unbusinesslike concessions.

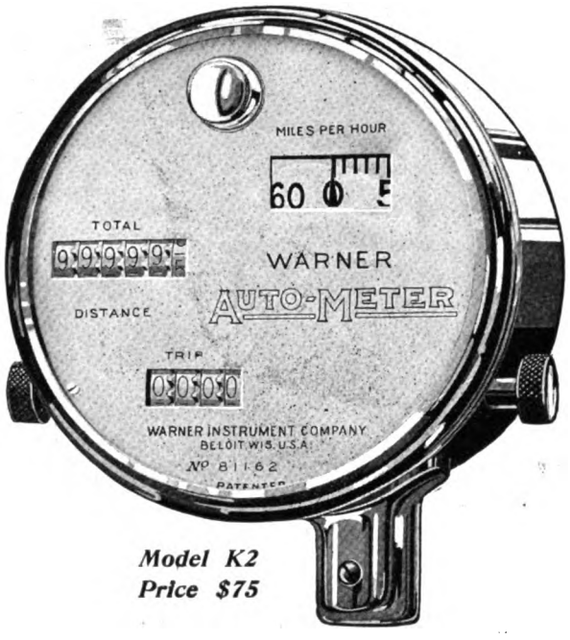
Pullman dealers are bound to succeed not because they make an exorbitant first profit, but because their customers having once used a Pullman car continue to use Pullman with little or no effort on the part of the dealer. Cost of up-keep and service to the customer is an absolute minimum with Pullman dealers.

There is still some good territory open and if you can qualify to our standard we have a very attractive proposition for you. Send us your name and address at once and we will furnish you with complete details as to the Pullman 1913 specifications, also complete information regarding our agency proposition in your territory.

"THE PALACE CAR OF THE ROAD"

PULLMAN MOTOR CAR CO., York, Pa.

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Model K2
Price $75

Warner AUTO-METER

FOR 1913 the world's largest automobile manufacturers will equip their cars with Warner Auto-Meters. Over 100,000 new cars will carry Warners as regular equipment.

Having decided to carry a speed indicator as "regular equipment," it naturally followed that the highest grade cars would select the highest grade speed indicator made. The Warner was selected. When it came to a final and thorough test the Warner proved its superiority under every possible condition.

Examine the speed indicator on the car you buy, for a manufacturer's equipment is a good guide to the whole character of his product.

Priced from $50 to $145. For sale at our own branches and by leading dealers all over the world.

Handsome catalogue on request.

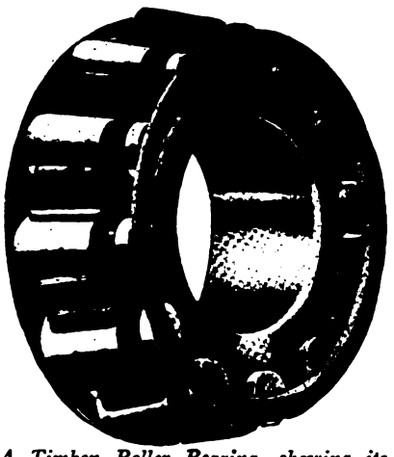
The Warner Instrument Company

Beloit, Wisconsin

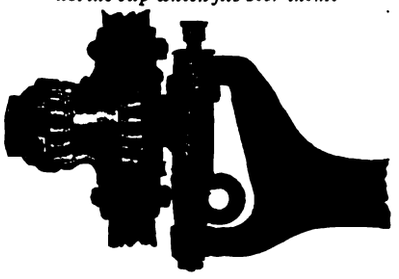
Atlanta	Denver	Philadelphia	Boston	Detroit	Pittsburgh
Buffalo	Indianapolis	Portland, Ore.	Chicago	Kansas City	San Francisco
Cincinnati	Los Angeles	Seattle	Cleveland	New York	St. Louis

Canadian Branch: 559 Yonge St., Toronto, Ont.

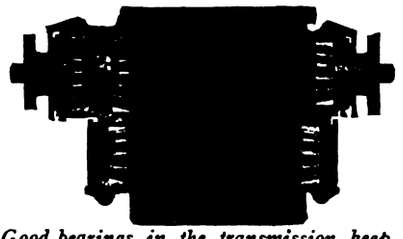
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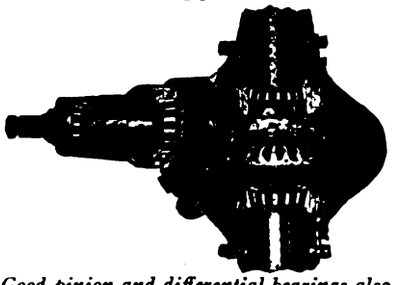
A Timken Roller Bearing, showing its cone, rollers and pressed-steel cage, but not the cup which fits over them.



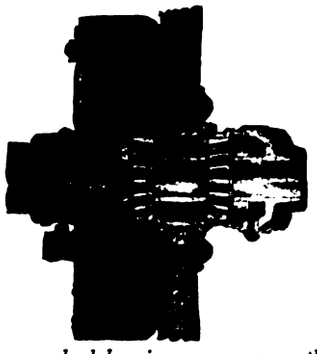
Front-wheel bearings must meet side-pressure often in excess of the vertical load.



Good bearings in the transmission keep shafts in line and gears in mesh—saving power.



Good pinion and differential bearings also mean efficient transmission of power—saving gasoline.



The rear-wheel bearings carry more than half the car's weight and burden.

Good bearings play a big part in getting every last mile from each gallon of gasoline, and in holding down the repair expense.

In the transmission, at the pinion shaft and the differential, bearings worn loose mean shafts out of line and gears out of mesh. These make noise and consume extra power which is extra (wasted) gasoline.

The utmost of power from the engine and the lowest of upkeep expense can only be had when the bearings fit snug and run smooth—all the time—for the life of the car.

TIMKEN
TAPERED ROLLER BEARINGS

Have Greatest Resistance to Wear

The Timken Bearing is made of special, Timken-analysis steel.

The steel is carbonized and heat-treated to make its surface glass-hard but not brittle.

Underneath the surface the steel is left tough and elastic to cushion the shocks.

The Load is Distributed

Load, on the Timken Bearing, is distributed over the entire length of its rollers, not concentrated at points, as is the case in a ball-bearing.

This wide distribution of load keeps pressure, and hence wear, down to the minimum.

The Timken principle of tapered rollers revolving about a tapered cone with two ribs—makes a bearing that takes end-thrust at the same time it is carrying vertical load.

And the end-thrust, too, is distributed along the length of the rollers.

So in material and its treatment—in principles of design—and in actual practice in thousands of pleasure and commercial cars—it is theory proved true, that—

Timken Tapered Roller Bearings offer the greatest possible resistance to the inevitable wear.

And when wear does come it can, in the Timken, be entirely taken up by adjustment without the least impairment of efficiency.

Are Adjustable (perfectly) for Wear

In every place where they are used, the bearings should keep shafts in alignment, keep gears in correct mesh, support the loads, take the "end-thrust," and all the time, hold friction down to a negligible quantity.

They must do these things when the car is new and they should do them when the wear inevitable comes.

There is no getting away from wear and there is no getting away from the necessity for adjustment to take up that wear

The Only Perfect Adjustment

Timken Bearings, like any good bearings, will show wear in time.

But the Timken has this advantage over all other types of anti-friction bearings—

It can be adjusted to completely take up that wear without the least sacrifice of efficiency.

The two ribs on the Timken Cone keep the tapered rollers always in perfect alignment—therefore the diminutive wear is uniform over the surfaces of cone, rollers and cup.

When the cone is moved just a trifle farther into the cup all parts are brought into the same identical relation as when the bearing was made.

No grooves can wear in the races. The rollers, though microscopically smaller, have still the same taper and, after adjustment, are just as snugly in perfect rolling contact with cup and cone as they were at the start.

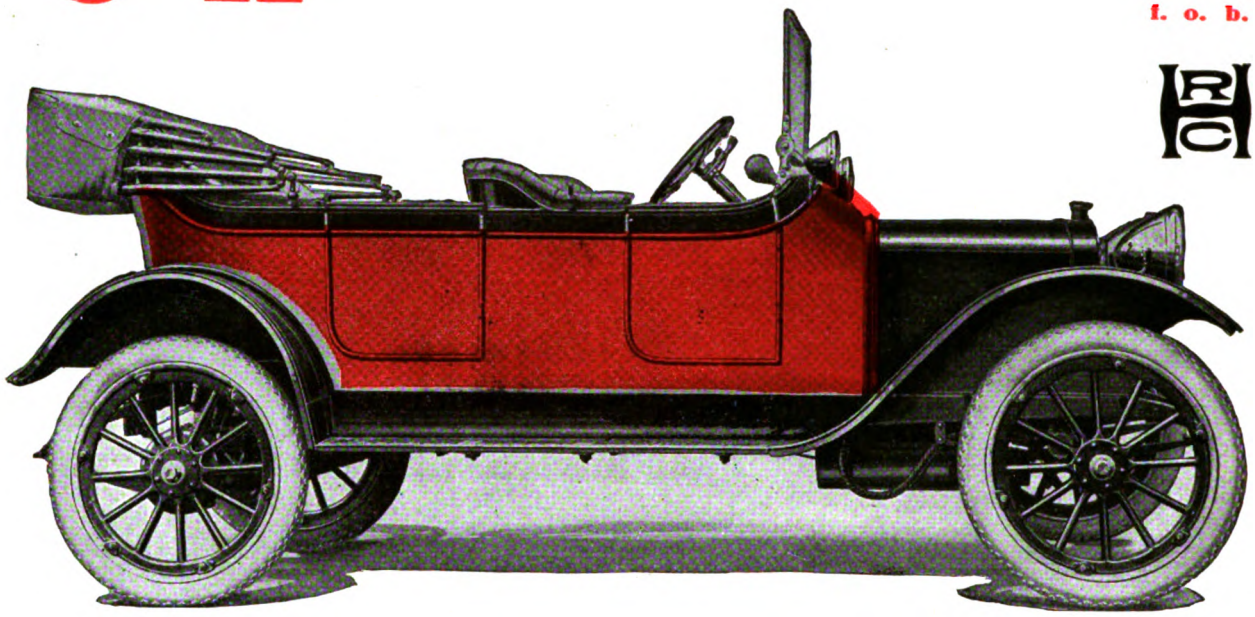
THE TIMKEN ROLLER BEARING CO., CANTON, OHIO
THE TIMKEN-DETROIT AXLE CO., DETROIT, MICH

For more than 14 years the Timken Roller Bearing Axle (made at Canton, O.) has been giving satisfactory service in horse-drawn vehicles

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R-C-H "Twenty-Five" $90

f. o. b. Det



The Car

WHEELBASE 110 inches.

MOTOR Long-stroke; 4 cylinders cast en bloc; 3¼ inch bore, 5-inch stroke. Two-bearing crank shaft. Timing gears and valves enclosed. Three-point suspension.

DRIVE Left Side. Irreversible worm gear, 16-inch steering wheel. Spark and throttle control on steering column.

CONTROL Center Lever operated through H-plate integral with universal joint housing just below. Hand-lever emergency brake at driver's right. Clutch pedal operated by left foot. Service brake operated by right foot. Foot accelerator in connection with hand throttle.

SPRINGS— Front, semi-elliptic; rear, full elliptic and mounted on swivel seats.

FRAME— Pressed steel channel.

AXLES— Front, I-beam, drop-forged; rear, semi-floating type.

TRANSMISSION— Three speeds forward and reverse; sliding gear, selective type.

CONSTRUCTION Drop-forgings wherever practicable; chrome nickel steel used throughout all shafts and gears in the transmission and rear axle; high carbon manganese steel in all parts requiring special stiffness.

BODY Full 5-passenger English type; extra wide seats; 10-inch seat cushions specially upholstered.

WHEELS— Artillery type.

The Equipment

Non-skid tires, 32 x 3½.
12-inch Bullet electric head light with double parabolic lens.
6-inch Bullet electric side lights with parabolic lens.
Bosch Magneto.
Warner Auto-Meter.
Demountable rims.
Extra rim and holders.
Tally-ho horn.
Jiffy curtains — up or down instantaneously.
Top and top cover.
Windshield.
Rear view mirror.
Tool-kit, Jack, Tire Repair Kit, Pump.
Robe Rail.

"OPPORTUNITY"

"Opportunity knocks once at every man's door" is an and threadbare saying. Whether or not **opportunity** ha the past knocked at your door, whether or not it will in future, is of no interest at this particular moment.

The most important point is that opportunity is knoc at your door **now.**

Here is the proof:

The R-C-H for 1913 is acknowledged everywhere to be greatest selling proposition ever offered to automobile dea

Consider these facts:

Many manufacturers are now idle for various reasons

Some of them are taking summer vacations.

Others have closed their plants for inventory and rep

Others are between seasons.

One or two have orders up to their capacity, and ca accept additional orders at this time.

The R-C-H plant, however, is working **night and day.**

We have been delivering, since the appearance of the models, **better than 50 cars a day.**

You can get the cars. Many of your competitors **ca**

The public is buying cars **now.**

This is your **opportunity.** Get the business while competitors are forced to be idle.

Then, too, remember that we are backing the whole pr sition with a National Advertising Campaign, the effici and extent of which have never been exceeded in this indu

The opportunity to "make a killing" with an R-C-H presents itself to you.

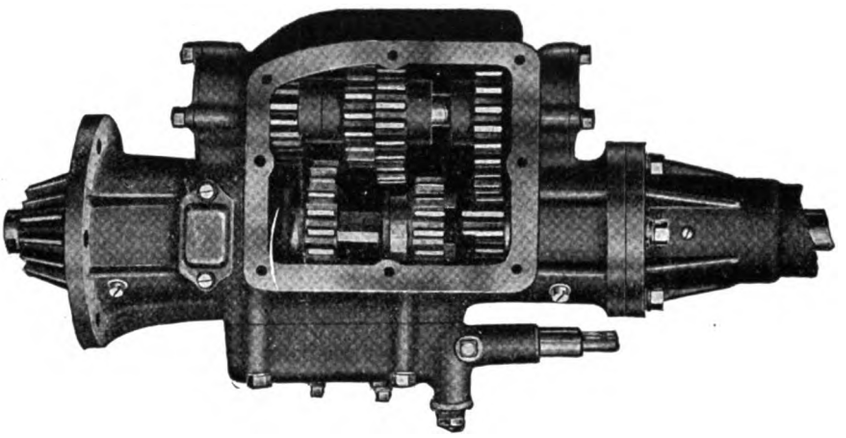
Now is the time. **Now** is the opportunity. It is ent within your power, Mr. Dealer, to accept or reject it.

R-C-H CORPORATION, 104 Lycaste Street, Detroit, Michig

Branches — ATLANTA, 548 Peachtree St.; BOSTON, 563 Boylston St.; BUFFALO, 1225 Main St.; CHICAGO, 2021 Michigan Ave.; CLEVELAN Euclid Ave.; DENVER, 1520 Broadway; DETROIT, Jefferson Ave. and Lycaste St.; KANSAS CITY, 3501 Main St.; LOS ANGELE South Flower St.; MINNEAPOLIS, 1206 Hennepin Ave.; NEW YORK, 1989 Broadway; PHILADELPHIA, 330 North Broad St.; FRANCISCO, 819-835 Ellis Ave.; WALKERVILLE, ONT., CANADA.

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COVERT



Commercial cars equipped with COVERT TRANSMISSIONS of proper size are immune to transmission troubles.

COVERT TRANSMISSIONS are specialized—our whole time and thought is given to their perfection and manufacture, in which we have incorporated the result of fourteen years experience. We have "ironed out the kinks" and refined the strong points.

Our manufacturing equipment is the last word in specialized machinery. By long practise our men have becime highly skilled along this line—they turn out better, and more work than is possible for an organization not so trained.

Specialized motors, axles and wheels, are better and cost less. The same applies to COVERT TRANSMISSIONS—whether one of our standard Jack Shaft or Rear Axle models, or for Unit Power Plant, or Sub Frame suspension.

Write us today.

Covert Motor Vehicle Co.
Sales Office: Ford Building
Detroit, Mich.
Factory: Lockport, N. Y.

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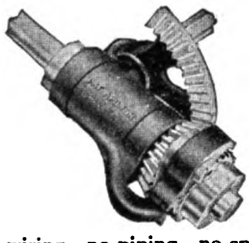
A Perfect Starter At Last!

Energetic Dealers Wanted

A rare business opportunity. Live dealers throughout the entire world wanted to represent us and to install the National Starter

The First Perfect Mechanical Starter

It has always been said that if a *perfect* starter could be built—a *dependable* starter—one that would start the engine from the seat and forever do away with dangerous cranking—that such a starter would revolutionize motoring—that it would add the final touch of perfection to the automobile.



—and now, after years of experimenting, comes the first *perfect* mechanical engine starter—the NATIONAL STARTER—the *only* starter that is actually 100% efficient.

Works *every* time.

No batteries—no tanks—no wiring—no piping—no springs. Nothing but simple ball-bearing gearing.

Dealers in automobiles and accessories, and garage owners will instantly recognize the tremendous business possibilities of this new starter.

The Principle of the National

The National is built on a patented principle.

It is purely mechanical.

A simple pressure of the foot and the engine turns over—just like cranking.

The powerful leverage which is obtained through gear reduction turns the engine over easily—*so easily that you can start on the magneto just as readily as on the batteries.*

The National works equally well in hot or cold weather. It is *not* dependent upon acetylene gas, compressed air, gasoline, electricity or springs. It develops its entire energy through the slight pressure of your foot on the dash pedal—like a clutch. In case of back-fire the National automatically disengages.

We have subjected the National to the severest tests. We have tried it out in all sorts of weather and on all sorts of cars. We made it *prove* its merits.

And now we back every National with an ironclad guarantee for one year.

Easy to Install—Easy to Operate

The National can be installed on any car in about two hours' time. It is fastened to the front of the car in place of the crank. Total weight is about 15 pounds.

THE NATIONAL GAS ENGINE STARTER COMPANY
Dept. 551B, 30-32 N. Dearborn St., CHICAGO, U. S. A.

Car Owners: *Write us for literature and name of nearest "National" dealer.*

Manufacturers: *Write us for literature and our offer to install the National as standard equipment.*

A ten year old child can operate the National easily. One pressure of the foot—the crank shaft turns—the engine starts. Just a simple mechanical operation.

A Big Business Proposition

The tremendous demand for a *perfect* starter makes the selling end of the National only a matter of proving its merits. *Thousands and Thousands* of car owners will install the National as soon as they see it.

They'll want the advantages of the National for themselves as well as to enable the women-folks to drive.

You see the field is practically boundless.

Big business men consider this a big enough proposition to *open up special demonstrating salesrooms for the exclusive sale of the National.*

They realize the wonderful possibilities of the National.

The retail price of the National is $50.00 *completely installed.* Figure out approximately the number of cars in your territory and you will have an idea as to how broad a proposition this is.

Applications for Agencies Now Being Received

Already we have received thousands of applications for National agencies. We are literally *swamped* with requests. South America, England, Germany, France—energetic dealers in all these countries have applied for National agencies as well as thousands of American business men. But we are prepared to meet the tremendous demand.

THE NATIONAL STARTER
TRADE MARK

We have practically unlimited manufacturing and financial resources.

Agencies for the National Starter are now being allotted. Applications will be handled in the order in which they are received.

Wire us, and come to Chicago if you can—let us show you just how the National is built—let us tell you in a personal interview the tremendous business possibilities of this proposition.

If you cannot come, write us. Full information and large descriptive circular can be had by signing and mailing the coupon.

Coupon for Free information

The National Gas Engine Starter Co.,
Dept. 551B, 30-32 N. Dearborn St., Chicago.

Gentlemen:

Please send me full particulars regarding a National Agency.

Name.....

Address.....

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1000 lb. Electric Truck

Standard in Every Detail

WE stated in a previous advertisement that the M & P Electric Truck was built before the selling price was decided upon.

In our initial plan and all the way through the processes of designing, building and finishing, we had quality in mind—quality that would mean service to the user.

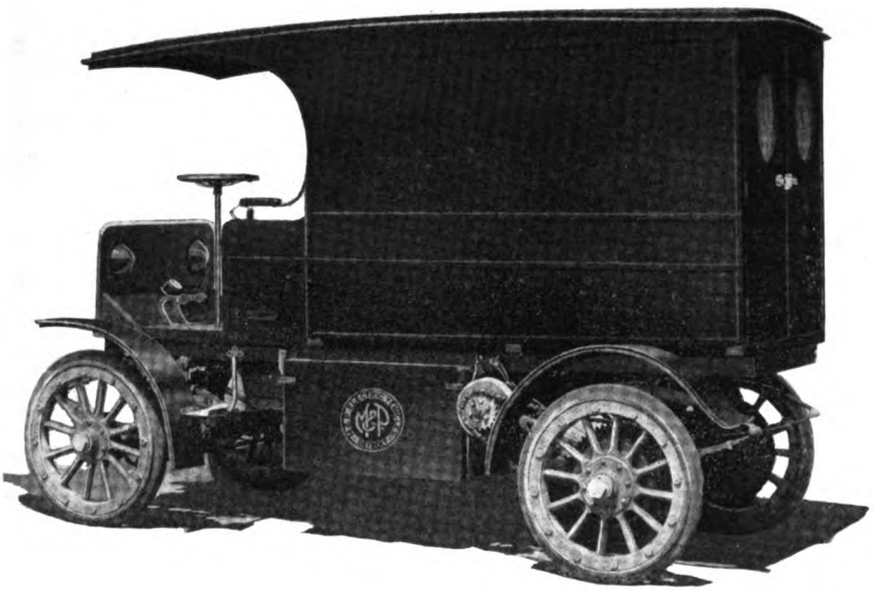
After this truck was completed to our satisfaction, we made the price — $1500 (other prices noted below).

You, Mr. Dealer, can offer to your trade the M & P Electric as embodying all of the good features and dependable worth of the electric truck that has, heretofore, sold from $2200 up.

You can put this machine within the reach of those who have heretofore been forced to be content with the cheap 1000-pound gasoline truck that sells for from $1000 to $1500.

You can offer (and we will prove) economy of operation and service double in value to that of a similar priced gasoline truck.

Remember the M & P Electric Truck is the finished product of long experiment, wherein the weak points common to other trucks have been eliminated, other features made stronger than ordinary and, as completed, a machine perfect in every detail.



There is money in this proposition for you — more, there is satisfaction that comes with selling dependable goods. Both are at your command and we solicit opportunity to go deeper into this subject with you.

THE PRICES: Chassis $1450 : Express Body $1500 : Enclosed Body $1600



M & P ELECTRIC VEHICLES · DETROIT · M&P

Franklin & Dubois Sts. *Detroit, Mich.*

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"The Horn that's Made for the Discriminating"

TUTO HORN

THE TWO TONE HORN

Why the Bulb Horn Is Retained.

IT is not necessary to argue and try to force intelligent motorists to put up with inflexible methods of signalling.

¶ The bulb horn is acknowledged inadequate for emergency purposes.

¶ Furthermore, the loud warning signal is completely unfit for all of the signalling.

¶ You would not shout a request when it can be made in a mild tone. It would be insulting to say the least.

¶ Neither would you whisper a demand when life, limb and property is at stake. This would be fool-hardy.

¶ Your warning signal must be capable of requesting firmly, but not extremely loud, the right-of-way.

¶ Then you must be able to give a loud commanding note, for emergencies or when the low note proves inadequate.

¶ The continual use of the loud note for all service, makes unnecessary noise, lessening the commanding effect of the emergency note by making the same unduly familiar when occasion does not require its use, invites adverse legislation and, last but not least, makes an excessive waste of battery current.

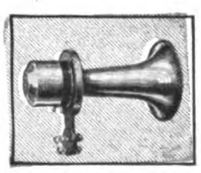
¶ Common sense, laws and ordinances, say to you that the low note must be retained.

¶ Until the advent of the TUTO Horn, with its complete signalling service, it was necessary to retain the bulb horn as the mild signal, despite its inadequate note and its insufficient means of operation.

¶ To-day the TUTO Horn is acknowledged by the most discriminating motorists, leading engineers and up-to-date sales departments as the only warning device that will do all of the signalling of the car in a most simple and safe manner.

¶ The TUTO Horn produces a low note which is effective fully 90% of the time and more adequate than the bulb horn, by an ordinary pressure on the operating button. Fully depressing this same button, gives the loud emergency signal, and there is no thought or extra movement of the hands required to go from the service to the emergency signal.

¶ What could be more effective and positive than the TUTO method of operation? The TUTO Horn comes complete with everything necessary to make a most permanent and neat installation on any type or make of car, and retails for $25.00 in any finish with a long or short projector.

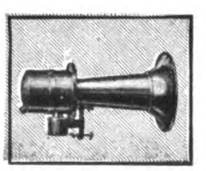


TUTO Horn, $25.00

The Dean Electric Co.

260 Taylor Avenue, Elyria, Ohio

"Look for Dean where Quality's seen"



TUTO-ETTE $17.50

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NET SALES GAIN 211 PER CENT.
over corresponding ten months of previous year.

Electrically Lighted
Self-Starting

NOT SILENT—but "a noise so faint one scarce distinguishes it from silence."

AMERICAN
UNDERSLUNG

IN the trade journals of the week of June 16th we made the announcement of the "American Underslung" line for 1913. We cited the phenomenal increase in sales of 211 per cent. in the past ten months over the corresponding period of a year ago. We reiterated our statement that the "American Underslung" is destined the final construction in motor cars.

We have evidence of our foresight. Our sales offices are deluged with inquiries. These come not only from the dealers. Hundreds of motorists have written us. This is undisputable testimony that the "American Underslung" will be a power in automobile evolution in 1913.

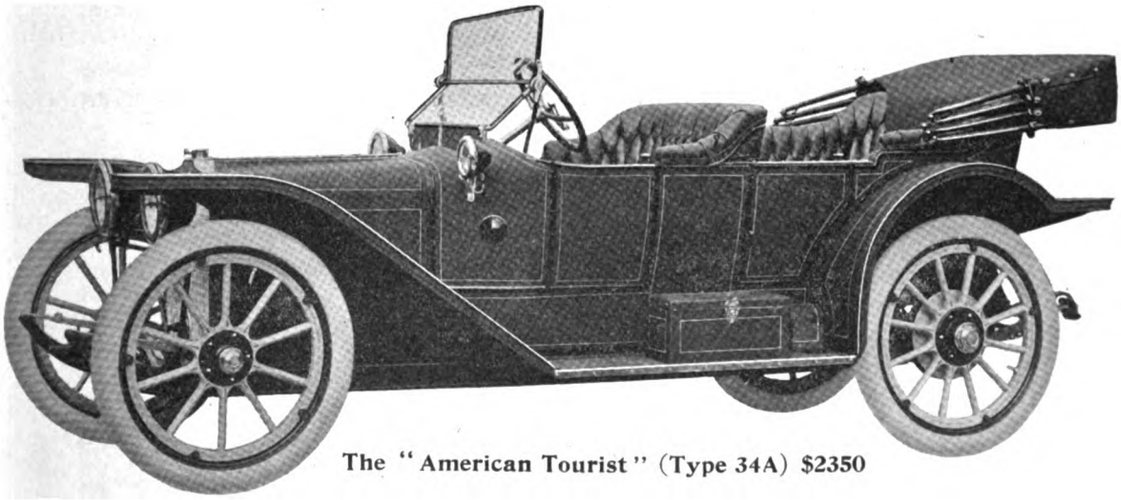
Now is the time for dealers to cash in on this rush to the *final type* in automobiles. We have enlarged facilities for taking care of this demand. We foresaw it. We are prepared.

The "American Underslung" differs in constructive principle. *The frame—the very backbone of the car—is slung under the axles instead of being placed over the axles.* The low center of gravity means SAFETY and added comfort; straight line drive means *less wasted power;* larger wheels mean easier riding, tire economy and *maximum road clearance.*

For the season of 1913 we announce our three famous standard models: the "American Traveler" (Type 56A), at $4500; the "American Tourist" (Type 34A), $2350; the "American Scout" (Type 22A), $1475, all fully equipped.

Write us for a handsome 1913 catalogue and a simple treatise an the "Advantages of Underslung construction."

American Motors Company
Dept. E, Indianapolis, Indiana



The "American Tourist" (Type 34A) $2350

Four passengers. Motor, four cylinders, 4 1-2-inch bore, 5-inch stroke; Wheel base 118 inch; tires, 37 x 4 inch; front and rear on Q. D. demountable rims.

$2350 includes regular equipment as follows; electric light dynamo outfit complete with generator and storage battery supplying five lamps. $50 Warner speedometer; fine plate glass wind shield; Disco self-starter; fine mohair top and curtains; high tension magneto and storage battery; one extra rim; shock absorber; robe rail: horn; jack, tool and tire repair outfit.

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ASK "HAYES" ABOUT YOUR SHEET METAL PROBLEMS

ON TIME

"On Time" are the two best words in the English language to the automobile manufacturer who, in the headlong rush of his busy season, is constantly fearing a holdup in bodies, fenders, or sheet metal work of any kind.

The Hayes enormous new plants and perfected system may be relied upon to produce the goods on the date specified. Furthermore, these goods will always be standardized and interchangeable. Hayes workmanship insures that.

The tremendous growth of the Hayes plant indicates the extent to which manufacturers are depending upon Hayes to "beat up" their own output. They find it a big advantage to have their fenders (fully enameled) brought into their factory completely assembled with fender irons and running boards ready for quick attachment, and at a price much lower than they can possibly do the work themselves. And the same is true of every sheet metal part that goes onto an automobile.



Manufacturers are finding out that it saves money and much valuable factory space to turn their blue prints over to the Hayes organization, and get their all-metal or wood-metal bodies delivered fully equipped with fenders and running boards.

It is the cheapest and most efficient method to double up production and deliver "ON TIME."

Hayes high-standard of quality and workmanship have never been questioned. In order to insure quick delivery, get your specifications in early.

Bodies	**Fenders**
Running Boards	**Shields**
Aprons	**Mufflers**
Dashes	**Shrouds**
Tool Boxes	**Battery Boxes**
Gasoline Tanks	**Prest-O-Lite Boxes, Etc.**

Everything in sheet metal for the automobile.

HAYES MANUFACTURING COMPANY, Detroit, Michigan

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1/4 MILLION

EXHAUST TUBES IN TWELVE MONTHS

We made this enormous quantity because we received orders for them. We received orders for them because we can make them better, cheaper and quicker than any one else.

We make them better because we have the most up-to-date machinery and employ only expert workmen.

We make them cheaper because we make our own tubing and make so many.

We make them quicker because we know how to make them and do not fuss, fret or fume if the job is new or a "sticker."

Our tubes are strong, accurate to dimensions and very light in weight.

It is not foolish to make your own tubes, but it's futile, especially when you can get what you want without wandering.

THE STANDARD WELDING CO.

OLEVELAND, OHIO

NEW YORK OHIOAGO DETROIT

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World's Greatest Racing Drivers Are Converts to Wire Wheels.

Hemery, the great driver, who has shone so spectacularly in this country in Vanderbilt races and in recent Grand Prix races, uses wire wheels on his present car, the Lorraine-Dietrich, which is shown herewith. Among others who are also converts to the wire wheel are Sizaire, Hanriot, Bablot, and many others less well known in this country.

This fact, and the simple showing of about 80% of the recent Grand Prix racing cars being equipped with wire wheels, means only one thing, the absolute supremacy of wire wheels.

Wire wheels mean greatly increased tire life (68.75% is the actual figure of extra tire mileage on wire wheels over wooden wheels as a result of a six months' test conducted at the English Daimler factory).

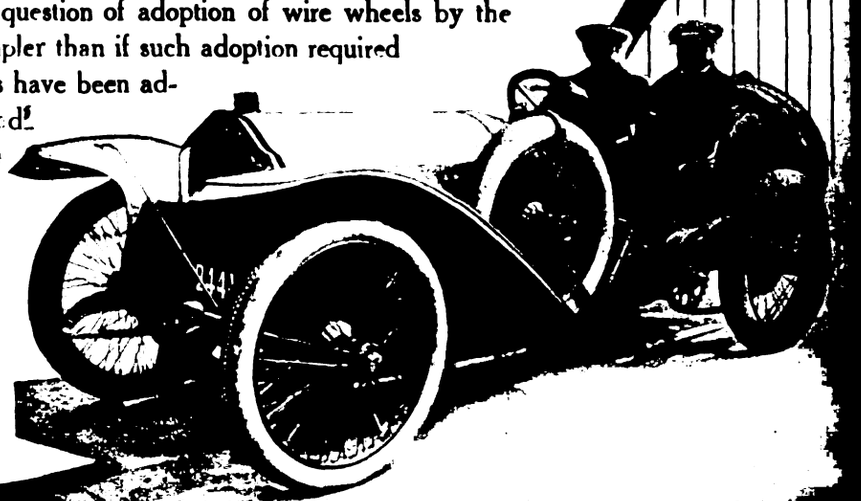
70% MORE TIRE MILES

WIRE McCUE WHEELS

Wire wheels mean more tire life, first, because they dissipate the excess of heat generated by the friction of driving; while wooden wheels being non-conductors of heat hold this heat within the wheels of the tires and the process of devulcanization takes place.

Wire wheels increase your tire life, in the second place, because of their greater flexibility. When a tire, mounted on a wire wheel, strikes a stone, the crushing force on the tire fabric is not nearly so great as though that same tire were mounted on a wooden wheel. The comparison is the same as striking your fist against a punching bag as compared with striking it against a solid stone wall.

The fact that McCue Axles admit of the use either of wire wheels or wooden wheels on the same spindle makes the question of adoption of wire wheels by the American manufacturer far simpler than if such adoption required special design. McCue Axles have been admittedly leaders for some time and now this latest improvement whereby they may be used for either wire or wooden wheels places them in a class by themselves.

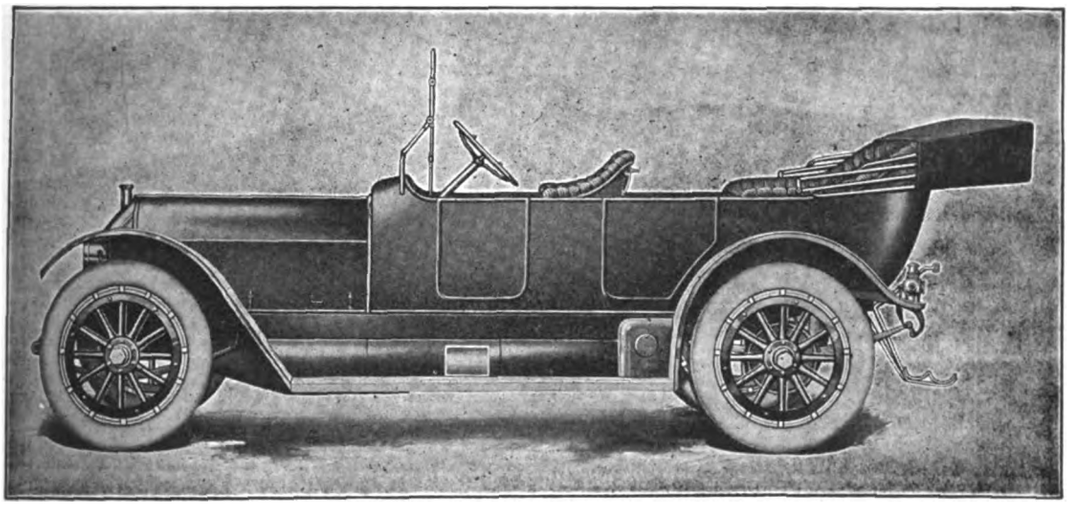


The McCue Company
Buffalo
New York

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Knox

Little Six—Model 46



The Car They Are All Talking About

Embodies the most advanced American and European ideas of approved design and construction.

A distinctive car of unusual power, quietness, comfort and style.

"It's the Car You've Been Waiting For"

- 6-cylinder motor, 4⅜" bore x 5½" stroke, A. L. A. M. rating 46 H. P.
- 130" wheel-base, 37 x 5" tires.
- Handsome V-shaped radiator.
- Silent chain-driven cam and magneto shafts.
- Option on right or lefthand steering control.
- Exceptional quietness in operation.
- Attractive straight line body designs with concealed locks and hinges.
- Clean running boards.
- Self-starter on motor.
- Dynamo lighting system.
- Unequaled riding qualities.
- Economical in operation and upkeep expense.
- Beautiful appointment and finish in optional colors.

Price with Standard Equipment on all Open Type Bodies.....$4350
Price with Standard Equipment on all Limousine Type Bodies.....$5350

The Car That Comes Nearest to the Ideal You've Cherished So Long

Send for Advance Folder and arrange for an early demonstration.

KNOX AUTOMOBILE COMPANY, Springfield, Mass.

New York — BRANCHES — Chicago

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Overland

WHAT will be the big selling line for 1913?

¶ This is the burning question uppermost in the mind of every dealer who looks ahead.

¶ We urge every agent who seeks to set the 1913 sales record for his district in the coming year to WATCH FOR THE OVERLAND 1913 ANNOUNCEMENT, which occurs on August 17th.

The Willys-Overland Company, Toledo, Ohio

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THE MOTOR WORLD

Vol. XXXII New York, U. S. A., Thursday, July 18, 1912. No. 4

GROUT AGAIN IN RECEIVER'S HANDS

Old Company Unable to Weather Death of Two Officials and Other Adversity—Its Recovery Doubtful.

For the second time in its troubled existence, the Grout Automobile Co., of Orange, Mass., is in the hands of a receiver. R. T. Shumway, a business man of that city, has been appointed by the Federal court to take charge of the plant, with authority to operate it temporarily. It is believed, however, that the financial condition of the company is such that it is not likely to recover from its embarrassment and that the property will be offered for sale.

The Grout company grew out of the sewing machine business of W. L. Grout, which was operated for several years by the Grout brothers, who first produced steam cars but later turned to the gasolene vehicle. Several years ago the business became financially involved, at which time E. S. Hall, an Orange lawyer, was appointed one of the receivers. In due course he organized the present company, which was capitalized for $100,000, of which John W. Wheeler became president, Hall himself assuming the office of treasurer. Walter Gould was vice-president and sales manager and George P. Dexter was the secretary.

Wheeler and Gould died soon after, and the brunt of the burden fell on Hall, who was more versed in law than in automobile affairs. The capital also proved insufficient, and the combined handicap proved so great that last week a receiver was applied for.

Splitdorf Begins Removal to New Jersey.

Removal of the plant of the Splitdorf Electrical Co. from New York City to Newark, N. J., commenced late last week, one of the several factories comprising the plant already being practically vacated. The equipment of the other buildings will be removed at opportune moments, but it is unlikely that the removal will be completed before September 1st; until that time, at least, the offices remain in New York. In Newark the Splitdorf plant will be concentrated in the building heretofore occupied by the Eagle Co., which is controlled by John F. Alvord, who acquired the controlling interest in the Splitdorf company, some two months ago. The Eagle Co., which manufactures marine engines and spark plugs, has been removed to Torrington, Conn., where other of Alvord's enterprises are located. When the removal of the Splitdorf plant to Newark is completed, a splendidly appointed service station will take its place in New York.

Brown Forms Another Truck Company.

While still retaining the presidency and general management of the Mais Motor Truck Co., of Indianapolis, Will H. Brown has organized the Brown Commercial Car Co., in Peru, Ind. Associated with Brown in the enterprise are several prominent automobile men and other residents of Peru, whose names for the present will not be disclosed. Brown will be president and general manager of the new company, which will produce a light four-cylinder truck of special design and incorporating several special features worked out by Brown himself. Its sales offices will be located in Indianapolis. It is stated that the Mais Motor Truck Co. is undergoing reorganization of some sort, but Brown will say nothing regarding it.

Oldfield Patent Bill Practically Dead.

Despite the strenuous efforts of the author of the Oldfield bill, which sought more or less to revolutionize the patent system in this country, Representative Oldfield himself admits that it will be impossible to induce the present Congress to pass his act or any other patent legislation. The Oldfield bill aroused widespread opposition, and its failure to make progress will cause no surprise. Mr. Oldfield, who is chairman of the House Committee on Patents, has not been able to induce his own committee to report his measure.

RESHAPING UNITED STATES MOTOR

Brush Runabout and All Two-Cylinder Models to be Discontinued but No General Upheaval in Prospect—Things Achieved and in View.

Beliefs that prodigious upheavals will follow the entry of the banking interests into active participation in the management of the United States Motor Co. are not likely to be borne out. Beliefs of the sort have given rise to such printed utterances that Benjamin Briscoe probably would retire from the presidency of the big corporation on August 1st next and that the Columbia plant would be removed from Hartford, Conn., to Dayton, Ohio, and consolidated with the Stoddard-Dayton plant, to mention but two of a number of somewhat similar instances.

As a matter of fact, the company is working out its problems in its own way, and while more or less internal reorganization will result, it will simply serve to more firmly intrench it in its position. There is no foundation for the reports that Briscoe will retire or that the Columbia plant will be removed to Ohio, nor will there be any general exodus of officials or employes or any far-reaching concentration of plants or models.

The Gray Motor Co., of Detroit, which made marine engines, has been resold to its original owners, and among other matters which have been definitely settled are that the manufacture of the Brush runabout will be discontinued, or practically discontinued, at any rate. Hereafter, it will be made only to meet immediate demands. Whether the Brush plant will be offered for sale or be used for other purposes remains to be decided. It is also settled that the manufacture of the two-cylinder Maxwell models will be discontinued, which means that hereafter the United States Motor Co. will have to do only with "fours" and "sixes." While the prices of the Brush runabout, $350 and $450, made it appear attractive and

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a limited demand still exists for two-cylinder cars, their manufacture has not proved profitable. Generally speaking, the public will have little, if anything, to do with other than "fours" and "sixes," and the United States company purposes to recognize the fact and to shape its productions accordingly.

The report that the Columbia factory would be removed to Dayton was published in conspicuous fashion in the Dayton papers, but it had no more basis in fact than that A. C. Mertens, superintendent of the Columbia factory, has been transferred to the Stoddard-Dayton plant and assumed charge thereof. The vacancy in Hartford caused by his transfer has been filled by appointment of C. J. Jamison, who has been designated factory manager of the Columbia plant; he previously was assistant in charge of manufacturing of the United States company, with headquarters in New York City.

None of the men conspicuous in the management of the company are slated to retire. The only one who has retired is Horace De Lisser, one of the vice-presidents, who has rejoined the Ajax-Grieb Rubber Co. With Alfred Reeves, one of the other vice-presidents, De Lisser shared the sales management of the big corporation. His retirement leaves the sales department entirely in Reeves's hands and with undivided authority, and with Reeves's undoubted ability and equally undoubted affability, good results are practically certain to follow.

The reconstruction of the United States Motor Co. is progressing satisfactorily, something like 90 per cent. of its creditors have agreed to the 90-day extension; practically the only objectors are comparatively small creditors, whose actions will not in any way disturb the progress of affairs. The 90-day period expires September 15th next, when it is probable that the refinancing plan now being worked out by the banking interests will be ready for adoption. So far as can be learned, it provides for a reduction of the company's capital from $42,000,000 to $25,000,000, which, in the words of a man high up in the company's affairs, "will represent exactly what we are."

Whatever plan may be adopted, it is certain that certain New York capitalists are so heavily interested in the company that it can be and will be carried through any storms. Its temporary stringency was due to the too common failing of overextending itself. As expressed by an official source, the company sought to do a business of $25,000,000 a year when it should have done about $18,000,000. The "forcing" that resulted in so many directions did not work out satisfactorily, particularly as the months of March and April were almost abnormal from the weather standpoint and made a quick turnover impossible. As it was, the company owed $7,000,000 in March before its goods really began to move, but it operated to such good advantage that by the first of June its indebtedness bad been reduced to $2,600,000.

London Hears of American Combination.

According to a report from London, "preliminary negotiations are well planned" for a combination which will include the Hudson, Franklin and the American Fiat gasolene cars, the Anderson electric and the Commer truck, the report adding that "at present the matter is being handled principally in London." On this side of the water little or nothing is known of the proposed combination. Representatives of at least two of the companies named state that they have heard something of such a movement but they take small stock in it. The others mentioned declare they know nothing about such negotiations. The fact that R. D. Chapin, president of the Hudson Motor Car Co., has been in England for several weeks, suggests that he may have a hand in the matter, but at the Hudson factory in Detroit it is denied that the company has any intention of entering such a combination.

Willys to Take Over Garford August 1st.

While John N. Willys has consummated the purchase of the Garford Co., of Elyria, Ohio, the actual transfer of the Garford property will not take place until August 1st. Meanwhile all of the common stock which Willys purchased will be deposited in a Cleveland trust company. When the transfer is completed the Garford officers and directors will resign, of course, and Willys and his lieutenants will step into their places. It is probable that the name of the company will be changed to the Willys-Garford Co., and that the title of the Gramm Motor Truck Co., of Lima, Ohio, which Willys purchased some three months ago, similarly will be changed to the Willys-Gramm Co.

Rushmore's Foreign Interests Reorganized.

Rushmore Lamps, Ltd., is the title of a new organization which has taken over the London business of the Rushmore Dynamo Co., of Plainfield, N. J. The business will be carried on at the old address, 46 Brewer street. The new company is capitalized at £20,000, made up of 7,500 6 percent cumulative preferred shares and 12,500 shares of common stock, all of £1 par value.

Bank Gets Judgment Against Dealer.

The Almy Motor Car Co., Walter A. Almy and Elizabeth Almy, of White Plains, N. Y., are debtors in two judgments filed this week in the New York county clerk's office by the First National Bank of White Plains. The judgments are for $780.84 and $882.57. The Almy company handles automobiles and maintains a rather imposing store.

Imperial Secures Another Jackson Plant.

The Imperial Automobile Co. of Jackson, Mich., on Thursday last acquired the former Buick plant in that city. The building acquired will add 350,000 square feet of floor space to the Imperial facilities and permit of the employment of 800 additional men. It will also permit the Imperial output to be increased to 8,000 cars per year.

Cooper Hewitt Sues General Electric.

The Cooper Hewitt Electric Co., of New York, has entered suit in the United States District Court for the Southern District of New York against the General Electric Co., of Schenectady, N. Y., for alleged infringement of patent No. 1,030,262, which is described in the patent specifications as "In a gas or vapor apparatus, the combination of two electrodes, a starting electrode, and a means for connecting the starting electrode with, and disconnecting it from, one only of the working electrodes." Briefly, the patent covers a variation of the principle upon which both the Cooper Hewitt mercury vapor lamp and the mercury arc alternating current rectifier are built, and was issued on June 18th, last.

Ford Planning Output of 150,000 Cars.

Henry Ford, president of the Ford Motor Company, sailed for Europe on Saturday last, accompanied by his family. He will be absent about six weeks.

Despite somewhat lurid reports to the contrary, Ford carried with him no idea of producing 250,000 Ford cars for the 1913 market. He is, however, actually planning an output of 150,000 cars. Apparently when this figure got abroad some ready reckoner found it easy to add a mere trifle of 100,000 cars to the Ford estimate.

Tire Filler Man Sails to Europe.

Growing out of a number of inquiries from foreign sources for the products of his company, A. H. Spiegel, who is secretary and treasurer of the Essenkay Co., of Chicago, Ill., which manufactures a tire filling compound, has sailed for Europe. He will remain abroad for several weeks.

Boulade Visits American Zenith Plant.

A. Boulade, general manager of the French Zenith company, is paying a visit to America. He is spending most of his time with the Zenith Carburetter Co., of Detroit, which, incidentally, has recently increased its capital stock from $10,000 to $30,000.

Studebaker Retires Block of Stock.

In accordance with the provisions of its charter, the Studebaker Corporation, of Detroit, Mich., has taken up and canceled $405,000 of its preferred stock issue. For the purpose, part of its profits for the fiscal year ending December 31, 1911, were used.

Ottomobile Acquires Factory in New Jersey.

The Ottomobile Co., of Philadelphia has acquired what was formerly the Alcott Foundry building in Mt. Holly, N. J., and is preparing to take possession. Part of the machinery already has been removed to the New Jersey address.

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DAIMLER LICENSES ARE AVAILABLE

Despite Recent Transactions, Others Will be Afforded Opportunity to Use its Patents—Three that Reach Far.

Until the consummation of the recent deal whereby the Daimler American rights, so far as they apply to commercial vehicles, were conveyed to the General Vehicle Co., of Long Island City, N. Y., and the rights for pleasure cars to a New York syndicate, which has not yet completed its organization, it is known that the Daimler Mfg. Co., of New York, which previously held all rights, was near to instituting a campaign of patent litigation. The matter had been placed in the hands of a prominent New York legal firm, and suits were in preparation, most of them, it is understood, being based on the Daimler change gate patent.

It is by no means certain that such intentions have been entirely abandoned, but apparently the recent transactions have served to somewhat alter the situation, and before instituting legal proceedings, to which they are adverse, the respective owners of the Daimler American rights will accord those who desire and who are considered worthy, licenses to operate under the several patents. These include not merely the change gate patent, but patents covering the Mercedes type of radiator and the flywheel fan, all of which the Daimler interests claim to control absolutely. Several parts manufacturers are said to be already negotiating for such licenses.

As the deal with the General Vehicle Co. bears date of June 18th last, all alleged infringers of the Daimler patents prior to that date are responsible to the Daimler Mfg. Co., of New York, but such licenses as may now be granted covering commercial vehicles will be issued by the General Vehicle Co.; all other rights still are controlled by the Daimler Mfg. Co., of New York, which was organized in 1899 by William Steinway, and which, since fire wiped out its plant in Long Island City several years ago, has not been in active operation, although it has still retained corporate existence.

Weed Scores Point in Appellate Court.

After considerable litigation, the justices of the United States Circuit Court of Appeals for the Sixth Circuit, in Cincinnati, O., Monday last, July 15th, dismissed the amended and final petition of the Atlas Chain Co. and the Perry Chain Grip Co. to intervene as defendants in the suit brought under the Parsons patent, No. 723,299, by the Weed Chain Tire Grip Co. against Dorsey E. Foote, of Cleveland, who was handling tire chain grips made by the Atlas and Perry companies. A preliminary injunction was issued against Foote last December, and in March of this year a motion made to dissolve the injunction was denied; thereupon an appeal was taken from the orders granting the injunction and denying its dissolution. In the Court of Appeals the Perry and Atlas companies filed the petition for intervention, alleging that they practically were defendants, having undertaken the expenses and defense of the suit. This petition was denied some time ago, but was renewed in amended form only to be denied again. Meanwhile, Foote, who traded as the D. E. Foote Rubber Co., has gone into bankruptcy.

Losey Rejoins Durant in Republic.

Although W. C. Durant is not yet ready to make known the names of the men who are associated with him in his new $65,000,000 Republic Motor Co., of Delaware, it is known that at least one of his lieutenants will be R. H. Losey, who has been appointed general sales manager of the Republic Motor Co. of New York, which is one of the ten similar companies in process of formation in as many states and which will go to make up the parent Delaware corporation. For the past four years Losey has been the head of the Indian branch of the Buick Motor Co., his connection with that company dating back to 1904, when, under Durant, who then was head of the company, he became one of its traveling representatives. In 1908 he was advanced to the managership of the branch, which position he has held up to the present time.

Former New Yorker Heads the Perfex.

The Perfex Co. of Los Angeles (Cal.), which recently launched its first car, has completed its organization by the election of the following officers: President, Paul Smith, formerly of New York; vice-president and general manager, James Fouche; secretary and treasurer, O. B. Hutchings; sales manager, J. B. Marrow. The company's plant is located at 126 East Jefferson street, Los Angeles, where 100 Perfex cars will be turned out during the current year. The car is of Fouche's design.

Crescent Air Starter Chooses Officers.

The Motor Appliances Co., of Detroit, Mich., which controls the patents under which the Crescent air-starting system is manufactured, has elected the following officers: President, Floyd W. Owen; vice-president, Edward T. Birdsall; secretary-treasurer, Frank Sturgis. In addition to these officers, the directorate comprises H. Stevenson, A. Brett Road, Charles Milne and John Lane.

Halliwell Acquires Stewart Gas Savers.

The Halliwell Co., of Los Angeles, has acquired the selling rights to the Stewart piston gas saver, made by the A. C. Stewart Machine Works, of Los Angeles, which also manufactures the Stewart carburetter. The transaction, it is stated, involves a contract for 90,000 of the fuel-economizing devices.

SIZZLING CHARGES AGAINST SEITZ

Applying for Receiver, Stockholder Alleges Varied Misdoings, Including Fake Books—Wants Directors Enjoined.

Charging gross mismanagement and alleging, among other things, that "an imperfect, incorrect and fraudulent" set of books has been intentionally kept and that certain property has been sold and a part of the proceeds diverted to the pockets of individual directors, Frank H. Carpenter, a stockholder, has applied to the Circuit Court of Wayne County, Mich., for the appointment of a receiver for the Seitz Automobile and Transmission Co., of Detroit, whose plant is located in Wyandotte, Mich.

Carpenter's complaint fairly breathes fire. He is the holder of $6,000 worth of Seitz stock, the par value of which is $10 per share, on which he states no dividend ever has been paid since the incorporation of the company in 1907. Instead, he represents that during the six months preceding December 1, 1911, there was a net loss of more than $18,000, due to alleged "gross mismanagement and fraudulent transactions." In addition to asserting that a fraudulent set of books has been kept for the last two years, Carpenter states that William J. Seitz, the president of the company, and his brother, John O. Seitz, have spent large sums of money in traveling, for which no accounting has ever been made, although often requested. The Seitz factory was closed from December 1st, 1911, to June 1st, 1912, during which time, Carpenter charges that the officers and directors paid to themselves large salaries. He states that since it was reopened, only five or six men have been employed and that they are merely assembling the material on hand, and that it is the intention of the officers and directors to close the plant as soon as this work is accomplished. He also declares that on January 13th last they sold to themselves property of the company valued at $31,000 for the sum of $31,500, of which the company received $21,000 in cash, the remainder being paid in stock owned by the directors involved. He specifically names Frank Marx, of Wyandotte, one of the directors, as having received $5,000 from the proceeds of this transaction.

On May 4th last he claims that the directors mortgaged other property for the sum of $18,000, and that the mortgage was executed by Frank Marx, August Loeffler, H. C. Woelmer and S. A. Kring, all of whom were officers and directors of the company. at the time of the transfer. This mortgage falls due one year from its date, when Carpenter states it is his belief that it is the intention of the directors to foreclose it, thereby excluding the stockholders from participating in any of the proceeds.

Previously, he alleges, another parcel of

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property which in 1907 was purchased for $12,560, was sold for $9,000, of which sum $5,000 was applied on the mortgage and the remainder of $4,000 turned over to the treasurer of the company, for which no accounting has been made.

In applying for the appointment of a receiver to conserve the property and wind up the company and to distribute the profits equitably, Carpenter asks that suits be instituted against the directors to recover the property and moneys involved, and that the directors be enjoined from selling the mortgaged property until an accounting shall have been rendered.

Taxicab Promoter Jailed for Theft.

Troubles have not come singly to George Lapp, of Jersey City, N. J., for, following suit for money owing by the Hudson City Auto Exchange, of which he was backer, and which nursed a taxicab scheme, he has been arrested and sentenced to serve from one to seven years in the New Jersey State Prison on the charge of stealing an automobile valued at $6,000 from a citizen of Newark. When Lapp first got back of the automobile exchange he stated to the Diamond Rubber Co. of New York that he would vouch for bills up to $2,000; so when the amount ran a trifle in excess of this figure the company, failing to collect, sued Lapp and was awarded judgment for $2,000; the rubber company then applied for a receivership for the concern, and one was appointed. The alleged theft occurred about the same time, and Lapp's troubles had their culmination on Friday last, July 12th, when Judge Martin, in the Court of Special Sessions in Paterson, meted out the sentence. Lapp's difficulties may be said to have been of simple origin, for before the exchange company was formed he confided in a friend that he was disgusted with the trolley service and thought there were enough more like himself to make a taxicab service profitable.

Locomobile Mortgages to Secure Bonds.

To carry out the plan of refinancing of the company, which was given in detail in the Motor World of June 6th, the Locomobile Co. of America, of Bridgeport, Conn., has filed a mortgage on its property to the amount of $1,500,000. The mortgage was taken up by the Bankers' Trust Co. of New York and will be used to secure the issue of 10-year 6 per cent. sinking fund bonds, for which the refinancing plan provides.

Corset Maker Gets Economy Truck Plant.

After two previous offers had been rejected, the creditors of the bankrupt Economy Motor Car Co., of Joliet, Ill., have agreed to the sale of the factory buildnig to a corset manufacturer for $14,649.66. Former officers of the embarrassed company sought to acquire the plant and employ it in the production of a popular-priced electric vehicle, but their offer was considered insufficient and was refused.

LAW'S DELAY MAY TERMINATE SUIT

Proceedings Involving Agency for Havers Car Develop Unusual Phase—Botto Succeeds in Opening Default.

Lack of despatch in the Supreme Court for New York county may or may not put a fiasco-like finish to the suit which was brought some two months ago by the Havers-Imperial Auto Sales Co., of 1662 Broadway, New York, against William M. Botto, of the Knickerbocker Motor Car Sales Co., of 1634 Broadway, to establish the true ownership of the agency in New York and vicinity for the Havers cars. The complainants in the action sought to rush it along through and get some sort of ruling on their motion for a preliminary injunction restraining Botto and his concern from handling the Havers line, but inasmuch as the Havers contract in question will die a natural death next month, there now are indications that before the ownership can be adjudicated there will be no contract to be owned. In that case, the Imperial company may continue the litigation, asking as damages the profits made by the Botto faction between the time of the business rupture and the expiration of the contract.

The Havers trouble, as the Motor World previously reported, began when Botto broke away from the Havers-Imperial concern, which claimed it was formed to handle the Havers, upon the promise that Botto would secure the contract, but shortly before the action was commenced the Havers business appeared lower down the Great White Way under the signboard of the Knickerbocker concern, in which Botto and one Edward F. Rush were prime movers. Uncomplimentary statements were bandied and legal horns were locked. Botto defaulted in answering the motion for a preliminary injunction, and the judge has as yet made no decision; several times Botto attempted to get leave to put in his delayed answer, and Tuesday of this week, when no opposition was offered, the judge gave him this permission. The whole matter now hangs on the decision and the time it is handed down.

Ideal Surrenders West Virginia Charter.

Having incorporated as an Indiana corporation, with $100,000 capital stock, the Ideal Motor Car Co., of Indianapolis, maker of Stutz cars, has surrendered its West Virginia charter. In obedience to the law, the West Virginia corporation has filed notice of its withdrawal from Indiana and revocation of its appointments of agencies.

Everitt and Flanders Lease a Building.

Although the "changes in the fortunes" of the Everitt Motor Car Co., of Detroit—as the situation was officially described—which was to result in the merger of the Everitt company and the Flanders Mfg. Co., has been deferred for good and sufficient reasons, the cordial relations and the understanding existing between the two corporations, has taken form in the joint lease of a new building in Detroit, which both will occupy as their sales rooms and business offices. The building, which is not yet wholly completed, is located at the corner of Warren and Woodward avenues, which is 125 x 150 feet.

Cole Establishes a Branch in Omaha.

The Cole Motor Car Co., of Indianapolis, Ind., has located a branch at 1102 Farnam street, Omaha, Neb. It will be in charge of E. E. Butler, but C. J. Corkhill, district sales manager, also will make his headquarters there. Both men have served terms on the selling forces of both the Olds and Apperson companies.

Crum Becomes a Kansas Manufacturer.

C. J. Crum, of Ottawa, Kans., who formerly sold the goods for a Lawrence (Kans.) concern, has acquired the business of manufacturing a carbon remover, a radiator anti-leak and several other automobile specialties. He will remove the business from Lawrence to Ottawa.

Milwaukee Plug Maker to Build Factory.

The Milwaukee Auto Specialty Co. of Milwaukee, Wis., maker of Victor and Centerfire spark plugs, has let contracts for the erection of a two-story building, 36 x 40 feet, at the corner of Seventh and Chestnut streets. It will represent an expenditure of $10,000.

National Malleable's President Killed.

John J. Manning, president of the National Malleable Castings Co., of Toledo, Ohio, was instantly killed at midnight on July 13th, when his automobile crashed into a street car. Manning, who formerly resided in Cleveland, was in his 56th year.

R. C. H. Opens Branch in Newark.

The R. C. H. Corporation, of Detroit, has established a factory branch in Newark, N. J., at 32 Halsey street, where both R. C. H. gasolene cars and Hupp-Yeats electrics will be handled. The branch is in charge of A. W. and W. R. Christopher.

Studebaker Opens Second Texas Branch.

To better meet the pressing demands of Southern Texas, the Studebaker Company of Texas, whose headquarters are in Dallas, has established a branch and warehouse in San Antonio. It is in charge of C. W. Hartman.

Tuttle to Quit Cars to Make Parts.

Harry Tuttle, service manager of the Dayton-Motor Car Co., Dayton, O., has resigned that position, his resignation becoming effective August 1st. Tuttle has in view the organization of an automobile parts company.

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Dothan, Ala.—Alabama Airless Tire Co., under Alabama laws, with $6,000 capital; to manufacture tires.

Wilmington, Del.—Gray Motor Co., under Delaware laws, with $550,000 capital; to deal in motors. Corporators—E. E. McWhiney, W. J. Maloney, N. P. Coffin.

York, Neb.—Mulig Machine Co., under Nebraska laws, with $5,000 capital; to manufacture motor car parts. Corporators—Charles E. Elmer, Charles F. Mulig.

Newark, N. Y.—W. S. Motor Co., under New Jersey laws, with $300,000 capital; to manufacture motor vehicles. Corporators—J. M. Woods, C. H. Tebbets, L. F. Fester.

Chicago, Ill.—Taylor Mfg. Co., under Illinois laws, with $9,000 capital; to manufacture automobile devices. Corporators—John L. Pearson, Walter D. Herrick, L. M. Brenner.

Chillicothe, Mo.—Chillicothe Automobile Co., under Missouri laws, with $10,000 capital; to deal in motor cars. Corporators—John F. Heger, Asa T. Kirtly, Byron B. Stevens.

Goshen, N. Y.—Coats Commercial Car Co., under New York laws, with $250,000 capital; to manufacture motor vehicles. Corporators—R. Gibson, Jr., L. B. Case, P. Crichton.

Memphis, Tenn.—Scott Motor Co., under Tennessee laws, with $10,000 capital; to deal in motor cars. Corporators—J. C. Scott, W. H. Hayler, C. L. Hunt, O. N. Barney, J. C. Simms.

Grand Rapids, Mich.—Simpson Automobile Co., under Michigan laws, with $35,000 capital; to deal in motor cars. Corporators—Edward W. Simpson, Earle R. Corbin, Frank J. Goders.

Seattle, Wash.—Jewell Carburetter Co., under Washington laws, with $250,000 capital; to manufacture carburetters. Corporators—R. W. A. Simmons, Stephen Chase and others.

Sewaren, N. J.—Perth Amboy Transportation Co., under New Jersey laws, with $25,000 capital; to operate a motor delivery. Corporators—I. J. Freeman, L. Chester, I. Robbins.

New Washington, Ohio—Reynolds Aluminum Co., under Ohio laws, with $10,000 capital; to manufacture aluminum castings. Corporators—F. W. Reynolds, Edward Geissman, J. A. Jacobs.

Cleveland, Ohio—Clutch Co., under Ohio laws, with $200,000 capital; to manufacture clutches, etc. Corporators—J. W. Thorman, O. W. Carpenter, H. F. Mayer, C. C. Cleland, W. B. Ten Eyke.

New York, N. C.—Orteig & Lopeday, under New York laws, with $20,000 capital; to deal in motor cars. Corporators—Geo. R. Loveday, Jules P. Orteig, Eugene Orteig, all of 1926 Broadway.

Cleveland, Ohio—King Valveless Auto Whistle Co., under Ohio laws, with $25,000 capital; to manufacture motor car devices. Corporators — Delroy Feffield, Orville C. Snyder, George H. Burrows.

Toledo, Ohio—Rapp Mfg. Co., under Ohio laws, with $15,000 capital; to manufacture spark plugs, etc. Corporators—Samuel W. Rapp, Clifford D. Stone, Samuel L. Thorburn, Chester D. Few.

New York, N. Y.—Munsing Tractor Co., under New York laws, with $600,000 capital; to manufacture motor cars. Corporators—Basil Magor, 30 Church street; Robert H. Allen, 120 Liberty street; Herman C. Kluse, 39 Orchard street, Elmira, N. Y.

Columbus, Ohio—Ideal Motor Car Co., under Ohio laws, with $200,000 capital; to manufacture motor vehicles. Corporators—C. G. Amendt, J. C. Reichert, D. M. Postlewaite, F. J. Shaffer, E. Bragunier.

Nashville, Tenn.—Southwestern Motor Car Distributing Co., under Tennessee laws, with $50,000 capital; to deal in motor cars. Corporators—J. W. Bondurant, N. S. Bruce, G. C. Love, T. B. Crenshaw, H. J. Reiner.

New York, N. Y.—Circle Taxicab Co., under New York laws, with $2,800 capital; to operate taxicabs. Corporators—John Hefferon, Margaret T. Hefferon, 9 West 107th street; John F. Kavanaugh, Catherine J. Kavanaugh, 446 Amsterdam avenue.

Brooklyn, N. Y.—Saratoga Garage, Inc., under New York laws, with $1,000 capital;

RANDALL-FAICHNEY CO.'S NEW FACTORY NOW NEARING COMPLETION IN BOSTON, MASS.



The building, which will be 60 x 250 feet and four stories in height, will afford 67,000 square feet of floor space. It is being erected in Jamaica Plain, a suburb of Boston

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to operate a garage. Corporators—Martin Stoehr, 1081 Myrtle avenue; John S. Klinger, 1101 East 36th street, New York City; George Rockenbach, 1871 Pacific street.

New York, N. Y.—Stationery and Marine Motor and Supply Co., under New York laws, with $50,000 capital; to manufacture motors. Corporators — Thomas Lillis, Grassy Point, N. Y.; Ralph A. Corely, Frederick Knipscher, both of Boonton, N. J.

New York, N. Y.—William C. Reynolds, Inc., under New York laws, with $3,000 capital; to deal in motor cars. Corporators —Charles W. Reynolds, 188 Wadsworth avenue; Rene Dequet, 105 West 101st street; Otto Schiller, 53 West 63d street.

New York, N. Y.—American Motor Freight Co., under New York laws, with $25,000 capital; to operate a motor delivery. Corporators—Harry G. Waring, Yonkers, N. Y.; Harvey W. Bell, 301 Palisade avenue, Yonkers; Howard G. Phillips, 220 West 98th street.

New York, N. Y.—Amherst Auto Renting Co., under New York laws, with $5,000 capital; to rent and deal in motor cars. Corporators—Peter V. Hoyt, 226 West 97th street; Daniel J. McAndrews, 141 West 96th street; George Schippereit, 177A 31st street, Brooklyn.

Changes of Corporate Names.

Toledo, Ohio—Rassel Motor Car Co. to Toledo Motor Truck Co.

Lexington, Ky.—Bayliss Motor Car Co. to Central Motor Car Co.

Cleveland, Ohio—Weaver-Sealand Motor Co. to Weaver-Twelvetree Motor Co.

Recent Losses by Fire.

Allenhurst, N. J.—Harry Content, garage destroyed. Loss, $13,000.

Milford, Mass.—N. L. Huff, garage and five cars restroyed. Loss, $15,000.

Peaceful Valley, Wash.—Spokane Cab Co., 1647 Walter avenue, garage and several cars destroyed.

Houston, Tex.—J. W. Davis, Milam avenue, carriage and automobile repair shop damaged. Loss, $700.

Boston Will Repeat Its Truck Show.

Although its inclusion in the N. A. A. M. national circuit made certain that Boston would stage its pleasure car show in 1913, no such assurance attached to the commercial vehicle show which the Boston Automobile Dealers' Association inaugurated this year. The association, however, this week announced that the truck show also would be repeated. As heretofore, both shows will be staged in Mechanics Building, the pleasure cars holding forth during the week of March 8-15, inclusive, and the trucks, under the auspices of the Boston Commercial Motor Vehicle Association, Inc., being exhibited during the week of March 19-26. Chester I. Campbell again will manage both functions.

"DOUBLE" CONCERN MUDDLES CASE

Business as Corporation and Co-partnership Causes Judges to Disagree—However, Suit Must be Retried.

The somewhat interesting and peculiar existence of Sewall & Alden, of New York City, insurance agents, both as a corporation and a co-partnership, which was nearly but not quite sufficient to disrupt opinion in Supreme Court for New York County in an action brought by the Renault Freres Selling Branch, Inc., to recover the price of a repair job, has proven the basis for a divided opinion in the Appellate Division. Whereas the jury in the lower court gave the Renault company a judgment for $2,051.88 and the judge denied a motion for a new trial, three of the five justices of the Appellate Division, on Friday last, July 12, reversed the judgment and directed a new trial, while two dissented.

The whole trouble followed an accident to a car owned by one Schuyler V. C. Hamilton, who carried accident insurance with the General Accident, Fire and Life Assurance Corporation of Perth, Scotland, represented in New York City by Sewall & Alden, but whether by the corporation or the co-partnership is a point in dispute. The Renault side of the case is that one Grassmuck, who was supposed to represent Sewall & Alden and who was an insurance adjuster, agreed to an estimate of repairs and said that Sewall & Alden would pay the bill. Another phase of the insurance agents' status is revealed in the opinion ordering reversal wherein it is said, "Grassmuck further testified that on other occasions in adjusting losses he signed the name 'Sewall & Alden, Managers' and that he intended so to sign in this case, and according to his recollection so dictated the letter, but that he signed it hastily and without examining it carefully and the word 'managers' was omitted." These judges, Laughlin, Ingraham and Scott, hold that the corporation "had nothing to do with procuring this insurance and had no interest therein or relation with the insurance company. . . . Grassmuck was not in the employ of the defendant and had no authority to represent it."

The dissenting justices, McLaughlin and Clarke, entered into the moral phase of the matter and in their vote for affirmance said, "It is conceded in the prevailing opinion that it does not appear that the plaintiff, prior to making the repairs, was aware of the fact that Sewall & Alden constituted a firm and was engaged in the same business as the defendant (the corporation). If plaintiff did not know of the existence of the firm it is difficult to imagine upon what theory, in view of prior transactions, the defendant can here escape liability on the ground that the firm gave the order, and not the corporation. The prior transactions, as already indicated, consisted in defendant's having similar repairs made and paying the bills therefor. Honesty and fair dealing required the defendant, if the transaction in question were by the firm and not by the corporation, to so inform the plaintiff."

Penn Inaugurates New Plant and New Cars.

Having completed its removal from Pittsburgh and taken full possession of its new factory in New Castle, Pa., the Penn Motor Car Co. has considerably enlarged its line. Previously it devoted itself to the production of the Penn "30," but it is now producing six models: a 30-horsepower roadster at $1,000, a 30-horsepower touring car at $1,100, a 45-horsepower roadster at $1,350, a 45-horsepower touring car at $1,400, and a 45-horsepower semi-racer at $1,600, also a 30-horsepower delivery wagon at $1,250. The New Castle plant, which has a capacity of 10,000 cars per year, is an imposing structure which covers slightly more than five acres of ground The main building is 510 x 60 feet and attached to it are six wings, each 60 x 150 feet. The entire building is of steel, concrete and glass, there being 12-foot windows around the entire structure. P. J. Keeling, who was treasurer of the Penn Motor Car Co., under the old order of things, now is president and general manager of the concern, E. E. Gregg is secretary and sales manager, M. O. Crawford is chief engineer and H. P. Hardesty factory manager.

Judgments Follow Prest-O-Lite Dispute.

Judgments which, were they against a smaller and less financially sound company, might cause come concern, were filed this week in the New York county clerk's office against The Prest-O-Lite Co., of Indianapolis, Ind., by the John R. Keim Mills, Inc., of Buffalo, N. Y., but instead of causing any alarm the debtor in the case is preparing to dispose of the matter, as it is a part of litigation between the two companies. The Keim mills manufactured tanks for the Prest-O-Lite company, and a dispute arose over a bill, whereupon the former brought suit in the Supreme Court for Erie county, N. Y., and secured judgment for $789.04 and $843.23 costs. The Prest-O-Lite Company took an appeal and arranged to give a bond for any judgment secured in the final stage of the action, but a "slip" in the bond matter, which, however, is easily righted, caused the filing of the judgments as a matter of protection by the Keim concern, and New York county was chosen as the place of filing, as the Prest-O-Lite attorneys are located there, and therefore can easily handle the matter.

Gasolene May Touch 20 Cents per Gallon.

According to reports which are gaining currency, the Standard Oil price-raising program calls for an ultimate price of 20 cents per gallon, delivered at garages. The big company has advanced the figures monthly from nine to 16 cents.

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A. J. McCutcheon has opened a garage in Branford, Conn.

Horn & Allen is the style of a new garage firm in Albion, Neb.

Andrew J. Caron, of Methuen, Mass., is to open a garage on Kirk street.

Elmer Gaylord will open a garage in Grand Junction, Ia.

C. L. Light, of Deep River, Ia., has sold his garage to Lee Jacobs.

P. L. Bewley, a Taft (Cal.) blacksmith, has added a garage to his shop.

L. C. McCray is about to open a garage, 50 x 70 feet, in Gainesville, Fla.

in Eaton Rapids, Mich. It will be 40 x 70 feet and will be the second in the town.

F. L. Smith and G. Edwards are about to engage in business in Porterville, Cal.; they will trade as the Porterville Vulcanizing Co.

C. Parker Stearns, a former chauffeur, of Hartford, Conn., has taken the Ford agency for Andover, Gilead and Hebron, in the same state.

William Stockwell and George Kjos of Sherwood, N. D., have dissolved partnership as garage proprietors; the latter retains the business.

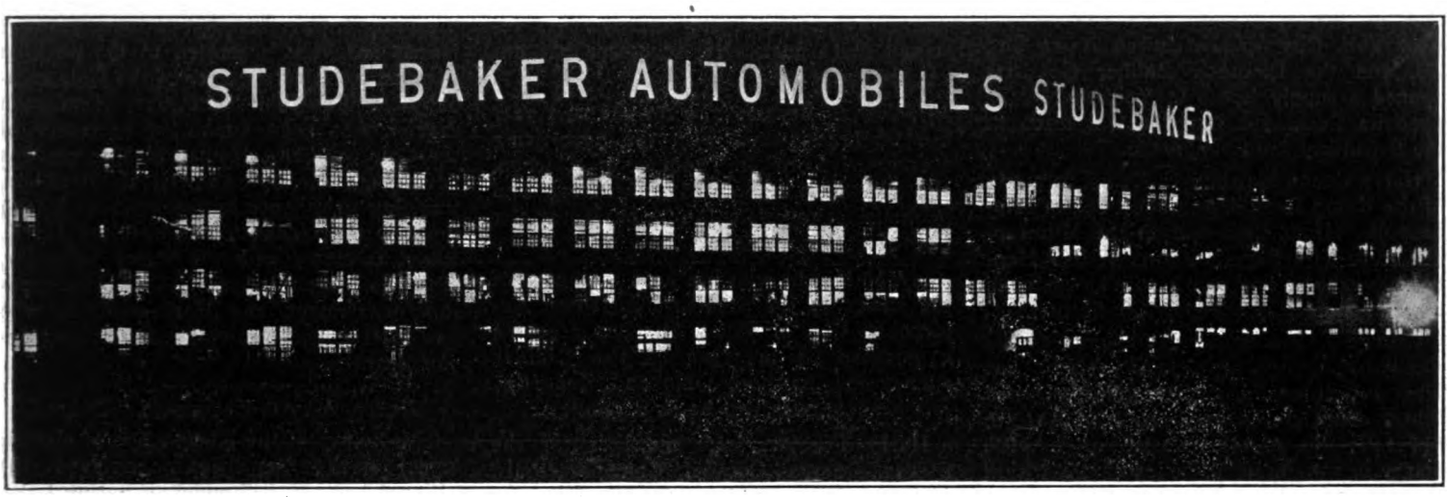
be located on Center street, near Fair Oaks.

Thomas E. Ward, of Sullivan, Ind., has purchased the interest of his partner, W. F. Ford, in the Ford Garage; the business has been moved to South Main street.

The Haas Building Co., of Los Angeles, Cal., has been granted authority to build a one-story garage at 184 Rose street; it will represent an expenditure of $6,000.

A. K. Lesher, a Reading (Pa.) restaurant proprietor, is to build a two-story garage, 40 x 100 feet, on Schley street, near Main; it will be of reinforced concrete and steel.

NIGHT VIEW OF THE STUDEBAKER PLANT ON THE DETROIT RIVER



The immense electric sign, which adorns plant 3, is 340 feet in length and the letters are 10 feet in height; 2,374 Tungsten lamps blaze nightly, current being furnished by a special generating set.

Charles Sherwood, in Watertown, Conn., has remodeled a barn into a garage.

Kirby & Hubbard, of Red Bank, N. J., are about to open a garage on Union street.

Arthur Brenneman and Joseph Ory are about to enter the garage field in Carlock, Ill.

John Pahnquist, John Footit and Charles Johnson are erecting a garage in Cromwell, Conn.

Z. K. Wright, of Lyons, Kan., has sold his interest in the Palace Garage to Edward Tobias.

Dundas & Gamble, of Riverside, Cal., are about to erect a two-story garage on Seventh street.

Charles A. Hastings is about to build a garage in Fitchburg, Mass. The Oakland agency will be a part of his business.

William P. Baldwin has opened an oxy-acetylene welding plant and repair shop at 56-58 East Water street, Chillicothe, O.

Frank Hamman is about to build a garage

The Joliet (Ill.) Auto Supply Co. is the style of a new concern in that town; Ben Moore, formerly of the Moore & Kickels Garage, is its manager.

G. L. Fenwick and H. Oyer have opened up in Marysville, Kan., at Ninth and Center streets; they will do business under the style Independent Garage.

Leon Bowen has secured permission to build a garage on Woodward avenue, between Ferry and Kirby streets, Detroit, Mich. It will cost $10,000.

W. M. and R. F. Wygant are building a garage at Central Valley, N. Y. They already operate a garage in Tuxedo Park, which is but a few miles distant.

Lavis Adolphson, formerly the proprietor of a garage in Springfield, Minn., has disposed of the business and is now connected with Kreitinger Bros.' garage.

Dr. Paul Deford, of Pasadena, Cal., is having plans prepared for a one-story brick commercial garage, 50 x 75 feet; it will

Earl Brown, formerly connected with the Davenport (Ia.) Auto Co., has branched out for himself under the style Brown Taxicab Co. His initial equipment is three cabs.

Permission has been granted to H. N. Moody of Peoria, Ill., to construct a one-story brick garage at 2006 Main street; it will represent an expenditure of $5,000.

A $10,000 garage, being erected at 102-4 Third street, Evansville, Ind., by David S. Bernstein, will be opened by Charles Jones of Indianapolis as soon as it is completed.

Benjamin L. Brundage, of Bakersfield, Cal., has secured permission to build a garage and storehouse at I and 15th streets; it will represent an expenditure of $4,800.

Arthur C. Kendall, of Pasadena, Cal., has taken the agency for Columbus Electric, Firestone-Columbus and Warren cars; he is temporarily located at 43 East Walnut street.

L. F. Hersh & Bro., wholesale grocers in Newark, N. J., are about to erect a garage,

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50 x 125 feet, at Madison avenue and East Grand street, Elizabeth, N. J. It will cost $20,000.

City Auto Supply House is the style of a concern which has opened up in Harrisburg, Pa., at 119 Walnut street; E. L. Leinbach of New York City is the head of the company.

R. S. Carter, former manager of the Island City Garage, of Galveston, Tex., has taken the Correja agency for that state; he is temporarily located at 219 City Bank Building.

O. H. Wienges, of St. Matthews, S. C., and Cecil Culler, of Orangeburg, in the same state, are making ready to erect a garage in the former town; Culler will manage the business.

Shriver Bros., proprietors of the Mount Pleasant Garage, 1336-40 Thompson street, Harrisburg, Pa., have taken over the East End Garage; the change carries with it the Overland and Velie agencies.

T. J. Snyder, formerly a salesman in New York City for the United States Tire Co. and the Diamond Rubber Co., has opened a supply house in Yonkers, N. Y., opposite Park Hill Inn; he will trade as the Broadway Auto Supply Co.

Harry C. and Matthew C. Kemp, formerly of the Kemp Bros. Automobile Co., of Minneapolis, Minn., have bought the Minneapolis Auto Tire Repair Station at 1629 Hennepin avenue; the name will be changed to Minneapolis Tire Repair Co. Station.

George J. Batzey, doing business as the Economy Garage, in Pontiac, Mich., has filed a petition in bankruptcy in United States court in Detroit. His liabilities are $1,711.90; his assets consist of a $900 equity in a homestead, which comes within the exemption law.

The W. N. Hellen Motor Car Co. of Omaha, has entered the trade with the Firestone-Columbus agency for Nebraska and Western Iowa; W. N. Hellen, the principal in the new concern, has been connected with the automobile industry for several years.

The Texas Wagon Works, of Houston, Tex., has secured the Texas agency for General Motors trucks and will supply bodies to fit chassis; J. P. Beck, formerly connected with the Houston Motor Car Co., is manager of the wagon company's new department.

The Everitt Auto Sales Co., recently incorporated to handle cars of that name in Ohio, has opened up at 307-9 Mt. Vernon avenue, in Columbus. Its officers are: President, H. K. Dobson; vice-president, Elmer E. McConaha; secretary and treasurer, A. F. White.

Although the mooted merger of the Everitt Motor Car Co. and the Flanders Mfg. Co. has not yet come to pass, the "understanding" that exists between the two companies was exemplified last week when the Flanders branch in New York City was appointed agent for the Everitt car in the metropolitan district; its territory reaches as far north as Poughkeepsie and as far west as Pittsburgh.

The Whiting Motor Co., which maintains stores in New York City and Newark, N. J., and which handles the Mercer car in New York and New Jersey, has taken over the Mercer branch in Philadelphia, which hereafter will be operated as an agency at the old address, 620-622 North Broad street. The transaction gives to the Whiting people the Mercer representation for New York, New Jersey, Pennsylvania, Delaware and Maryland.

Changes Among Prominent Tradesmen.

H. L. Winter has resigned as sales manager of the Federal Motor Truck Co. of Detroit. He will take up similar duties with the Universal Motor Truck Co., of the same city.

R. M. Jones, sales manager for the Church-Field Motor Co., of Sibley, Mich., makers of Church-Field electrics, has resigned that post. His successor has not yet been appointed.

Walter C. Barnes, who for the past year has been connected with the advertising agency of Lord & Thomas, of Chicago, Ill., has been appointed advertising and publicity manager for the Moon Motor Car Co., of St. Louis, Mo.

Mason Towle, who has been in charge of the affairs of the Steinhart & Jensen Automobile Co., of Joliet, Ill., has accepted a position as manager of the Cadillac agency for Southern Ohio and Kentucky. His headquarters will be in Cincinnati.

Harry Fosdick, sales manager for the Stevens-Duryea Co., of Chicopee Falls, Mass., and one of the veterans of the industry, has resigned that office. His future plans are not public property, but it is known that he will locate in Detroit, where he will have to do with a popular priced car.

E. E. Guthrie, H. E. Westerdale and A. B. Caldwell have been appointed managers of the R. C. H. Corporation's branches in Kansas City, Chicago and Cleveland, respectively. R. C. Jordan, who formerly was connected with the Boston branch, has been transferred to the Los Angeles branch, where he will assume the duties of territorial manager.

Following the sale of the Mercer branch in Philadelphia to the Whiting Motor Co., W. A. Smith, advertising manager of the Mercer Automobile Co., who served also as manager of the Philadelphia branch, has been transferred to the factory in Trenton, N. J., where he will devote himself wholly to the advertising and publicity interests of the Mercer company.

W. J. Voit, manager of the Diamond Rubber Co.'s Spokane branch, has been promoted to the management of the Los Angeles establishment, which is now one of the largest Diamond branches in the West. He succeeds F. O. Nelson, who resigned after eleven years of service to engage in business for himself. The vacancy in Spokane has been filled by the promotion of J. O. Stewart, former manager of the Diamond branch in Oakland, who in turn has been succeeded by A. G. Potter, previously connected with the Diamond company's San Francisco office.

Henderson Staff Goes Over to Cole.

Having been formally absorbed by the Cole Motor Car Co., of Indianapolis, practically all of the men comprising the staff of the Henderson Motor Sales Co., which previously marketed the Cole output, have been taken in the Cole organization. Charles P. Henderson, head of the Henderson company, has become general sales manager for the Cole company, while H. C. Lathrop, who was secretary and treasurer of the sales company, has been appointed manager of the Cole branch in Indianapolis and allotted a generous slice of territory. Of the other former Henderson men, Edward Harris has been promoted to the position of assistant sales manager of the Cole company, while John Murphy, Henderson cashier, has been appointed secretary of the Cole concern. Homer McKee remains advertising director and H. C. Bradfield, traveling newspaper representative. Among the new men added to the post are Jay D. Riker, formerly with the Parry Mfg. Co., who has taken charge of the Cole promotion department, and Harlow Hyde, who has entered the company's advertising department.

Klaxon Baby is Christened "Klaxet."

The "baby" of the Klaxon line of electric signal horns has been christened the "Klaxet," and H. I. Stengel, of Spring Lake, N. J., who, among some 10,000 contestants, suggested the monicker, has been awarded the $100 prize which the Lovell-McConnell Mfg. Co., of Newark, N. J., offered for the most appropriate name submitted and accepted. Several others suggested the same name, but Stengel's was received first. The new horn operates on exactly the same principle as the Klaxon and the Klaxonet, its mechanism consisting of a steel diaphragm vibrated by a motor-driven steel ratchet wheel, and will be marketed under the same guarantee. It is a smaller horn than either of the other two, however, and will list at $12. It will be ready for the market about August 15th.

Newtone to Offer a Horn at $10.

Interest has been added to the already tense situation existing in the electric horn trade by the announcement that the Automobile Supply Mfg. Co., of Brooklyn, N. Y., maker of the Newtone horn, is about to add a popular priced horn to its line. It will be styled the Newtone Superior, and will list at $10. It is a smaller reproduction of the regular Newtone, and measures 11 inches over-all, with a seven-inch bell.

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THE MOTOR WORLD

PUBLISHED EVERY THURSDAY BY

The Motor World Publishing Company

1600 BROADWAY, NEW YORK, N. Y.

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CHICAGO, 1441 Monadnock Block
J. FRANK GILMORE

Subscription, Per Annum (Postage Paid) $2.00
Single Copies (Postage Paid) . . . . . 10 Cents
Foreign and Canadian Subscriptions $3.00
Invariably in Advance.

Postage Stamps will be accepted in payment for subscriptions. Checks, Drafts and Money Orders should be made payable to The Motor World Publishing Co.

☞Change of advertisements is not guaranteed unless copy therefor is in hand on SATURDAY preceding the date of publication.

Contributions concerning any subject of automobile interest are invited and, if acceptable, will be paid for; or, if unavailable, will be returned provided they are accompanied by return postage.

Cable Address, "MOTORWORLD," NEW YORK.

Entered as second-class matter at the New York Post Office, November, 1900.

NEW YORK, JULY 18, 1912

CONCERNING THE USE OF "SILENT" CHAINS.

There is little doubt but that the popularity of the "silent" chain as a means of driving camshafts and magneto shafts is increasing, for already several well-known manufacturers of poppet-valve engines have adopted it, not to mention the several makers of Knight engines, whose products scarcely would be considered complete without it. Also, there is little doubt but that the use of the chain itself for this purpose is an excellent thing—provided the application is proper, and what is directly to the point, is in accordance with the experience of the chain makers themselves.

For instance, there is the question whether or not means of adjustment should be provided. From first examination, it would seem that there is little excuse for adopting a construction in which no means of adjustment is provided. It has been demonstrated that it is impossible to manufacture a chain to an absolute tolerance. That is to say, the limit of accuracy is governed by machine shop practice, and it is practically impossible to finish parts to closer than one thousandth part of an inch. As each chain is composed of a great number of individual parts the total error amounts to approximately the same number of thousandths of an inch as there are links in the chain, though it is not the same in every case.

This error causes a certain amount of slack on the non-driving side, of course, and it is this slack which causes whipping and imposes very much greater strains on the chain than it would be called upon to withstand under normal straight driving conditions. It must be understood that the load thrown suddenly on a slack chain causes stresses so severe that the normal stress appears small in comparison. As to just what the allowable slackness may be, authorities differ, though Hans Renold, of the noted firm of foreign chain manufacturers, has laid down an immutable law for his own factories which limits the maximum amount of slack in any high speed chain to 0.125 inch. The necessity of maintaining the minimum amount of slack consistent with proper operation is important enough in his opinion to warrant the extra expense involved in providing some means of adjustment.

Incidentally, by providing means of adjustment, the manufacturer eliminates any initial slack necessitated by the great difficulty of manufacturing a chain which shall join up and leave the exact amount of looseness that is desirable. As idler wheels impose additional wear on the chain, even if they bear on the reverse side of it, the problem resolves itself into the adoption of some form of driving or driven sprocket wheel that may be shifted to take up the slack, and though this method entails a certain amount of extra manufacturing cost, it may, in the opinion of not a few, be the means of distinguishing a really good car from a "pretty good" one.

CALIFORNIA'S DISPOSITION TO SECEDE.

Because the American Automobile Association has disciplined a race promoter and two officials who flagrantly violated its rules and its instructions and who permitted the public to be hoaxed by permitting the same cars to compete under different names, at least a small number of Californians have aroused themselves to a state of mind. They freely talk of seceding from the A. A. A. and setting up their own establishment and governing themselves. A San Francisco paper goes so far as to predict that if the A. A. A. "continues to rule on the lines of 'that it is It,' there is no question but what the Pacific Coast will break away from its authority and organize an association of its own;" all of which is interesting, if not convincing. But before California or any other part of the Pacific Coast decides to "break away," it best had commune calmly and seriously with itself. For that the A. A. A. is "it" and will continue to be "it," there is no shadow of a doubt.

It is the inherent privilege of any man or collection of men to "break away" and do what they will, but such performances are more or less amusing and usually terminate sadly. There is nothing to prevent seceders from playing in their own backyards, if they are content to do so, but if in California, or in any other part of the Pacific Coast, there are strong men and reasoning men who know the narrowness and folly of such backyard frolics, they will put an end to the secession talk as quickly as they know how. National authority is necessary to keep sport wholesome, and, lax in some things, the A. A. A., in the instance in dispute, acted the part it was organized to act and for the best interests of the sport. It is remarkable that in the State of California there can be found anyone ready to come out into the open and defend men who have been guilty not only of violating established rules and defying recognized authority, but who are party to an ill-smelling attempt to deceive the public.

On previous occasions and in other sports California has shown a disposition to flock by itself, but always the result has been to confine Californians to California. Outside their own State they were persona non grata and therefore without standing, which surely is not a condition to be deliberately courted.

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PATENTS MAY OFFEND SHERMAN LAW

Massachusetts Court Expresses Belief that they May be Employed to Promote Monopolies—Case that Inspired Opinion.

Whether a patent may be so worked or otherwise employed as to constitute restraint of trade, and thereby violate the Sherman anti-trust law, is a point which was seriously considered by the Supreme Court of Massachusetts in the case of United States Shoe Machinery Co. vs. La Chappelle, the text of which just has been published; and while admitting that the final decision rests with the Supreme Court of the United States, the full bench of the Massachusetts Court expresses the belief that there is nothing in the Sherman act which reveals an attempt to exempt owners of patents from its sweeping provisions against monopolistic combinations.

In the La Chappelle case, the suit was based upon the specific performance of a contract between the parties, the agreement providing, among other things, for an employment by the plaintiff of the defendant in designing and improving shoe machinery, terminable at the will of either party, with stated wages. One paragraph of the contract bound the defendant to assign to the plaintiff any and all inventions, improvements and patents which he should make during the continuance of the contract and for ten years thereafter, and for a like period not to engage in any similar business. Since leaving the company's employment, the defendant has taken out a patent for an improvement in shoe machinery which he refuses to assign to the plaintiff, and the suit was brought to compel such assignment.

The main inquiry was, first, whether the plaintiff has acquired an illegal combination in restraint of trade, and, second, whether the contract sought to be enforced is a contract in direct aid of such monopoly. Both these subsidiary questions must be governed by decisions of the Supreme Court of the United States for they relate to interstate commerce and the meaning of the federal statute touching that subject. The defendant averred that in 1899 the plaintiff was constituted by the combination of seven or more pre-existing corporations competing with each other in two-thirds the States of the Union, being all the principal shoe machinery manufacturers in the country, and that by their merger the plaintiff acquired monopolistic control of the business of manufacturing, leasing and selling throughout the country machinery for the manufacture of footwear; that since 1899 it has bought competing corporations to the number of at least thirty for the purpose of diminishing competition, and thus gained control of 90 per cent. of the shoe machinery business; that it has achieved and maintained its monopoly of manufacture and trade and commerce by contracting with 95 per cent. of the inventors of shoe machinery for the entire product of their inventive skill through contracts similar in form to that with the defendant; and that by these means it has stifled competition, so that it now controls from 90 to 95 per cent. of all the shoe machinery in the country. The lower court excluded all evidence under this averment.

The court points out that in a wide sense the term monopoly defines a combination or an organization so extensive, exclusive and unified that its tendency is to prevent competition in its comprehensive sense, with the consequent power to control prices to the public harm. The plaintiff was decided to approach closely to this definition, and the further question then arose whether a combination of several patentees of competing devices is within the inhibition of the antitrust statute. The holder of a patent is given an absolute monopoly of the invention covered thereby, not affected in any degree by the Sherman act. A combination of persons who had been competing in the market under sundry patents, for the purpose of ending the competition and acquiring thereby complete mastery of a branch of interstate commerce, was the gravamen of the defence. The decision emphasizes the point that nothing in the Sherman act reveals an intent to exempt the owners of patents from its sweeping provisions against monopolistic combination, and states that there appears to be no inherent natural distinction between owners of patents and owners of oil which would justify the application of the statute to one and not to the other.

With respect to the final contention that the contract is in direct aid of the illegal combination amounting to monopoly of trade in contravention of the federal statute, the court cites numerous cases which have been heard by the Supreme Court of the United States, and draws the distinction that such contracts, to fall within the intent of the Sherman act, must exert a direct restraint upon commerce. The conclusion is that patent agreements of the kind in question, which was one of many similar contracts with individuals enough to constitute a practical monopoly of skill in that department, are by virtue of their common association and interest, a part of an illegal combination. The term of the contract provision with the defendant requiring assignment of inventions for ten years after the termination of employment savored of restraint of trade, and while a single such contract is far away from interstate commerce, the individual aspect is lost in the larger relations of the case. The exceptions of the defendant are sustained by the court on the ground that, as an integral part of an unlawful scheme for monopolizing commerce between the State which cannot be perpetuated successfully without contracts of like tenor with all practising a like craft, the agreement in questions partakes of the illegality of the scheme as a whole.



July 9-24, Indianapolis, Ind. — Annual Four States tour of the Indiana Automobile Manufacturers' Association.

July 15-20, Milwaukee, Wis.—Reliability tour, under the auspices of the Wisconsin State Automobile Association.

July 21, St. Louis, Mo.—Track races under the auspices of the Universal Exposition Co.

July 22-28, Dallas, Texas—Farm and Ranch Tour under the auspices of the Dallas Automobile Club.

July 24, Scranton, Pa.—Track races under the auspices of E. A. Cusick.

July 24-31, Minneapolis, Minn.—Reliability tour of the Minnesota State Automobile Association.

July 27, Wilkesbarre, Pa.—Track races under the auspices of E. A. Cusick.

July 27, Grand Rapids, Mich. — Track races promoted by the Grand Rapids Automobile Club.

August 8-10, Galveston, Tex.—Beach races under the auspices of the Galveston Automobile Club.

August 24, Uniontown, Pa. — Hill climb under the auspices of the Automobile Club of Fayette County.

September 2-3, Indianapolis, Ind.—Races on the Motor Speedway, promoted by the Indianapolis Motor Speedway Co.

September 7, Hadine, Minn.—Track races promoted by the Minnesota State Fair Association.

September 17, Milwaukee, Wis.—Grand Prize road race under the auspices of the Milwaukee Automobile Dealers' Association.

One Ticket for Both New York Shows.

It has been definitely settled that one admission fee will admit to the shows in both Madison Square Garden and Grand Central Palace, New York City, next January. It was anticipated that such a provision would be made, but it was not formally decided until Thursday last, 11th inst., when the Automobile Board of Trade held its regular quarterly meeting in New York City, the exhibitions in both places constituting one show, under the auspices of that organization. Pleasure cars will be housed in both buildings during the week January 11-13. They will be replaced the following week, January 20-25, by commercial vehicles. At last Thursday's meeting of the Board of Trade, resolutions appropriate to the death of Alfred M. Mayo, treasurer of the Knox Automobile Co., which is one of the oldest members of the Board of Trade, were spread on the minutes.

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ELGIN ROAD RACES ARE RESCUED

After One Chicago Club Drops Them, Another Unexpectedly Steps in—The Program as Rearranged.

At the eleventh hour the Elgin road races, which, as stated in the Motor World last week, were abandoned by the Chicago Motor Club, were rescued, and from an unexpected quarter. For the Chicago Automobile Club, which has not promoted a speed event since the Crown Point road races of 1909, has stepped into the breach and will run the Elgin races in conjunction with the Elgin Automobile Road Race Association, and it is confidently expected that sufficient entries will be signed up to make the affair a success.

The race, which had been sanctioned to be run on August 23rd and 24th, has been postponed one week, so as to give the new management sufficient time to get in "apple pie order," and will be run on Friday, August 30th, and Saturday, August 31st, provided sanction is granted by the contest board of the A. A. A., and of this there seems to be no doubt. Unlike the procedure which heretofore has been adhered to, of running three preliminary events on the first day and the free-for-all on the second, this year two events will be run on each day and all will be for non-stock cars.

On Friday the program will comprise a Class C event for cars with displacement of 231-300 inches, which will go for 152.5 miles or 18 times around the course, and a Class C event for cars with displacements of 301-450 inches, which will go 24 laps, or a little better than 203¼ miles. The prizes for the first event will be the Aurora trophy and $700 in cash for first, $200 for second and $100 for third. For the second event the prizes offered are the Illinois trophy and similar cash prizes.

On Saturday, however, will be witnessed the "big" races, the first a 254-mile event, which will be run for the Elgin National Trophy and which is open to Class C and Class E cars with displacements up to 600 inches. Besides possesion of the Elgin trophy for a year, the winner of this 30-lap race will receive $1,000 in cash, second will receive $300 and third $200.

The free-for-all event, which in all likelihood will be the more interesting of the two which are on the program for the second day, will go for a little better than 306 miles, or 36 circuits of the course, which surveys 8 miles 2,499 feet. This event is open to any car which conforms to the definition of a motor car as laid down by the rules of the A. A. A. and is worth $1,750 to the winner, while second and third will receive $500 and $250, respectively.

Whether "cut price" entry fees which have been inaugurated—the fee being $100 a car as against $300 which was charged last year—and an increase in the value of the cash prizes, which is more than double the value of the prizes heretofore offered, will draw sufficient entries to make the races a success cannot as yet be foretold.

Pabst Trophy to be Milwaukee-made.

When Col. August Pabst, of Milwaukee, Wis., decided to offer a trophy for a light car race to be run near that city in September in connection with the Vanderbilt Cup and Grand Prize contests, that he planned no unworthy gift is indicated by the size and detail of the object designed by the Louis Esser Co., of Milwaukee, whose suggestion, shown by the accompanying illustration, was chosen from a field of 22. When completed the silver cup will be over three feet high and sixteen inches in diameter. Surmounting it will be a figure of Mercury, the messenger of the gods of ancient Greece, his foot upon a domed base encircled by cantas leaves, this much forming the cover, which will be removable. Upon a shield on one side of the cup proper, in a Louis XIV design, will be a speeding automobile. Winged automobile wheels ornament the legs and the whole rests upon a mahogany base.



PABST SILVER TROPHY

Lack of Entries Kills Two Events.

Forestville, N. Y., which was to have witnessed a hill climb on Sunday afternoon last, July 14th, was disappointed. The program was abandoned by the Forestville Motor Club only after several weeks of "rooting" for entries had been carried on to no avail. A reliability run, which was to have started from Cleveland, Ohio, under the auspices of the "Cleveland News" on Monday, July 15, also did not materialize.

FUN MARKS FOUR STATES TOUR

Indiana "Boosters" on Sixteen Days' Tour to Advertise Their State—Frolics and Factory Visits En Route.

Singing their "merry roundelay" to the accompaniment of a pipe organ which is mounted on a Nyberg truck and a player piano carried by a Whitesides, the only other commercial vehicle in the caravan, the Four States tourists who left Indianapolis on Tuesday last, 9th inst., on the annual "boost Indiana" trip, are flooding each of the towns along the 1,200 mile route with automobile literature, talk, and the strains of that hymn of good fellowship, "Hail, Hail, the Gang's All Here."

The "Howdy, folks, howdy!" slogan first was sounded at Peru, Ind., which was reached on the afternoon of the 9th, where a luncheon served at the expense of the Great Western Motor Co. and a trip made through the factory where the car chosen for pathfinder of the tour is made. At Kokomo, which was reached later in the afternoon, the Haynes factory was looked over, after which the party proceeded to Fort Wayne, the night control, which was entered by the Four Staters by at least as many different routes. The cause of the split was the absence of a confetti-marked trail, which ended abruptly at Huntington, where the supply of paper bits carried by the confetti car had given out. An abundance of confetti having been obtained by the course marker, the tour left Fort Wayne on the morning of the 10th, and it was not long before the cars were kicking up Ohio dust. Lima, the night control, was reached without incident, and the morning of the third day was spent in an inspection of the Gramm truck factory, and in listening to the exhortations of a "suffragette," who took up a collection for the "cause," but later was shown to be one of the tourists who had impersonated a female and hoaxed his fellow travelers.

The evening of the third day disclosed the "boosters" at Tiffin, while Akron was reached on the evening of Friday, 12th. Saturday was a "day of rest" and was spent in inspecting the manufacture of tires at the various factories in the tire city. Sunday morning was spent in a "plunge bath party" tendered by Firestone Esterly. The tourists will "do" West Virginia and Kentucky before they head about for the return to the Hoosier City, which, if things go according to schedule, will be reached on Wednesday next, July 24th.

Bathrick Heads Battle Creek Club.

George H. Bathrick has been chosen to head the newly formed Battle Creek (Mich.) Automobile Club. The other officers are: Vice-President, W. I. Fell; secretary-treasurer, H. W. Johnson; directors, N. E. Hubbard, C. Grandin.

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TETZLAFF SHINES IN PORTLAND

Takes Five Out of Ten Events—Oldfield Heinemann and Fritsch also Figure in Oregon Meet.

Match races made up half of the program of the two days racemeet which was run on the Country Club mile track at Portland, Ore., July 9th and 10th, by the Portland Automobile Club, for of a total of ten events, five being of the match variety. Theodore Tetzlaff, who was present and who naturally piloted a Fiat machine, captured five of the ten events on the program.

On the first day of the meet William Fritsch (Cino) took a five mile match race from Lew Heinemann (Benz), completing the distance in 5:21½. Tetzlaff won the five mile Class E event from a field of three, his time being 4:59. Barney Oldfield, who piloted the Christie's front-drive car, made the best time in the single mile time trials, when he covered the distance in 53 seconds. Tetzlaff won the five mile match race from Fritsch in 4:47. The free-for-all event, which was to have gone for five miles, was called off when Chris Dundee, a local driver, who was at the wheel of a White steamer, met with an accident which wrecked the machine and nearly killed the driver.

A three-mile match race between Heinemann (Benz) and Fritsch (Cino), which was run on the second day, resulted in a victory for the former, who covered the distance in 3:01. Oldfield "tackled' 'the winner in a two-mile match event and drove the Christie over the tape four seconds ahead of the Benz, the time being 1:51. Tetzlaff compelted the first of the five-mile Class E events in 5:16⅗, winning from Verbeck (Fiat) and Hill (Fiat), and the second in 4:39⅕, winning from Fritsch (Cino) and Heinemann (Benz), who finished in the order named. Heinemann took a mile match race from Fritsch in 54⅗ seconds. A single mile time trial which Tetzlaff completed in 53⅕ seconds marked the end of the second day's program. The summary:

Tuesday, July 9th.

Five miles, match race—Won by William Fritsch (Cino); second, Lew Heinemann (Benz). Time, 5:21½.

Five miles, for cars with displacements of under 600 inches—Won by Theodore Tetzlaff (Fiat); second, Verbeck (Fiat); third, Hill (Fiat). Time, 4:59.

One mile, time trials—Barney Oldfield (Christie), time, :53; Tetzlaff (Fiat), time, :54; Dundee (White Steamer), time, :54⅗.

Five miles, match race—Won by Theodore Tetzlaff (Fiat); second, William Fritsch (Cino). Time, 4:47.

Wednesday, July 10th.

Three miles, match race—Won by Lew Heinemann (Benz); second, William Fritsch (Cino). Time, 3:01.

Two miles, match race—Won by Barney Oldfield (Christie); second, Lew Heinemann (Benz). Time, 1:51.

One mile, time trial—Theodore Tetzlaff (Fiat). Time, :53⅕.

Five miles, for cars with displacements of under 600 inches—Won by Theodore Tetzlaff (Fiat); second, Verbeck (Fiat); third, Hill (Fiat). Time, 5:16⅗.

Five miles, for cars with displacements of under 600 inches—Won by Theodore Tetzlaff (Fiat); second, William Fritsch (Cino); third, Lew Heinemann (Benz). Time, 4:39⅕.

One mile, match race—Won by Lew Heinemann (Benz); second, William Fritsch (Cino). Time, :54⅗.

Police Stop Moross's Sunday Meet.

As a sequel to the "cold shoulder" which was directed toward E. A. Moross and his more or less merry men when they made their appearance at Davenport, Ia., on the 4th inst., the sheriff of Canton, Ohio, placed two of the headliners of the troupe, "Bob" Burman and Harry Kyle, under arrest on Sunday last, 14th inst., for breaking the blue laws, by participating in a racemeet on the Sabbath. The pair was placed under arrest on a warrant sworn out by the members of the Christian Endeavor Society after Burman had succeeded in breaking the local track record for one mile in the first and last event which was run, driving the Blitzen Benz twice around the half-mile circuit in 1:12½. Bail was quickly furnished by the manager, but to the great disappointment of the crowd the races were postponed until the following day. So great a disturbance was raised by the 10,000 spectators that it took a detachment of the Ohio National Guard to prevent more serious trouble.

Even the threatening weather which greeted the racers when they turned out on the track on the following day, Monday, 15th inst., was not considered sufficient excuse to again disappoint the crowd. Four events were run, and but one, 25 miles, for cars with displacements under 451 inches, was shortened on account of the threatening rain, 10 miles only being run. The summary:

Ten miles, for cars with displacements of under 451 inches—Won by Robert Burman (Benz); second, Kyle (Cutting). Time, 13:27½.

One mile, time trial—Robert Burman (Benz). Time, 1:10.

Three miles, for the Remy Brassard and trophy, first heat—Won by Robert Burman (Benz); second, E. A. McDonald(Benz); third, Kyle (Cutting). Time, 2:35. Second heat—Won by Robert Burman (Benz); second, E. A. McDonald (Benz); third, Kyle (Cutting). Time, 2:40.

Three miles, free-for-all handicap—Won by E. A. McDonald (Benz); second, C. J. White (Velie); third, Kyle (Cutting). Time, 3:01.

FOURTEEN IN WISCONSIN CONTEST

Less Rigorous Rules Than Formerly Promise More Clean Scores—Five Days of Travel Entailed.

Fourteen motor cars, groomed for a tussle with the sandy and otherwise bad roads of Wisconsin, left Milwaukee on Monday morning last, 15th inst., in the Wisconsin State Automobile Association's third annual reliability tour for the Sentinal Cup. The first day's journey led to Beloit, a distance of 113 miles, where the tourists were banqueted by the Warner Instrument Co.

Although the 610 miles of state highways which will be traversed by the caravan before the return to Milwaukee on the evening of Friday next, July 19th, are, owing to the late spring, which has handicapped road work, by no means in the best of condition, it is confidently expected that clean slates will be the order, since the rules under which the tour is being conducted are less stringent than those that obtained in previous years. Grade III rules are in force, under which penalties are awarded only for work done on the car while "en route"; the technical examination of the cars at the conclusion of the contest is done away with. Unlike the previous contests, fuel need not necessarily be taken on only at the noon or night control, for no penalty attaches to the filling of tanks on the road.

The itinerary of the tour is as follows: July 15, Milwaukee to Beloit, 122.9 miles; July 16, Beloit to Baraboo, 133.2 miles; July 17, Baraboo to Oshkosh, 134.5 miles; July 18, Oshkosh to Green Bay, 109.3 miles; July 19, Green Bay to Milwaukee, 129.1 miles.

The contenders are: Emile Hokanson, Buick; Jacob Hanson, Case; P. B. Hustis, King; James Holmes, Krit; Jay E. Morehouse, Hupmobile; W. H. Diener, Ford; Thomas R. Bell, Flanders; W. H. Soules, Flanders; Charles F. Spooner, Oakland; R. D. Rockstead, Paige; H. R. Gallun, Marion; R. G. Bates, White; H. O. Stenzel, White; J. D. Babcock, Franklin.

Thompson Enters Motordrome Project.

Replacing H. E. Hoyt, who is an official of the American Potash Co., Jefferson DeMont Thompson, a far more experienced man, has been elected president of the Metropolitan Motor Speedway Association, which is undertaking to build the two-mile motordrome on the New Jersey meadows near Newark. Although of late he has played no part in automobile affairs, Thompson at one time was a national figure. For several years he was chairman of the A. A. A. racing board, and during the three years, 1906-08, he was chairman of the Vanderbilt Cup Commission. He was also treasurer of the Long Island Motor Parkway. Thompson is a man of means who has traveled extensively.

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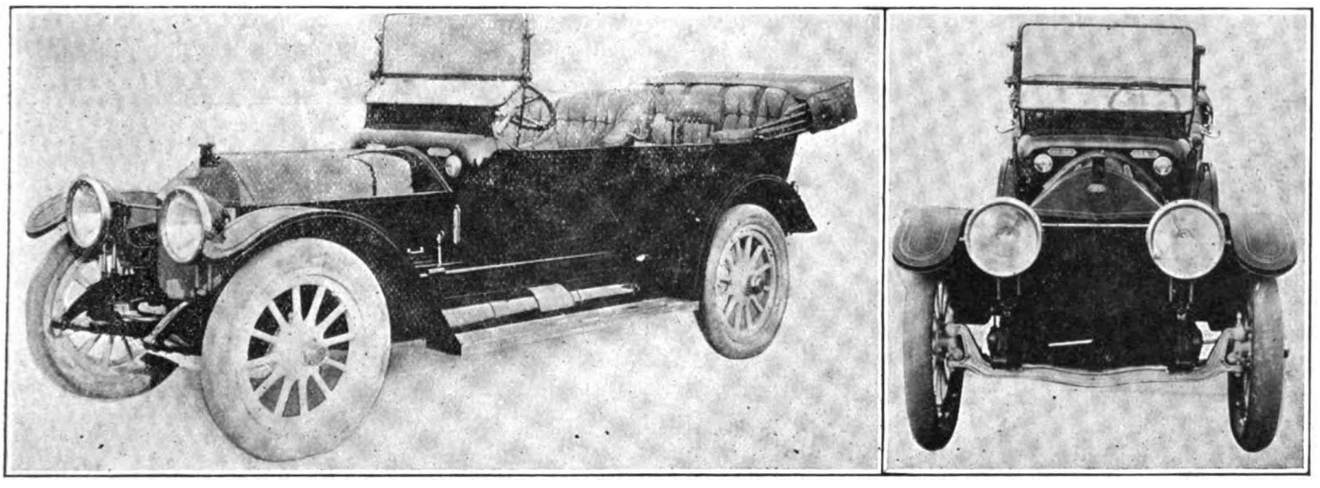
KNOX'S "LITTLE SIX" LOOMS LARGE

Newcomer Proves an Uncommonly Attractive Creation—Its Features and Refinements that Mark Other Knox Models.

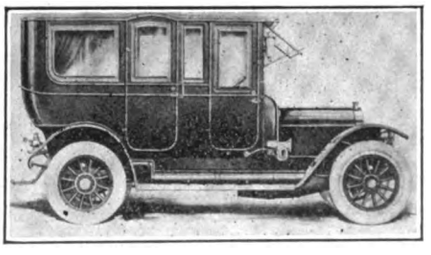
When a veteran like the Knox Automobile Co., of Springfield, Mass., essays the production of a new model it is a practical assurance of its complete and unqualified success. If there was one word which combined in its meaning such qualities as beauty, a smoothness of action which surpasses even that of the other cars upon which the Knox reputation has been built, flexibility and, last but not least, dependability, then that word best would describe the new Knox "little six," which has been more than two years coming through the mill and which at last has reached its finished form. It has 12 years of experience builded into it and it looks and acts the part. It is the "baby" of the line in the sense that it just has been born, so to speak, and though it is smaller and lighter than the standard six-cyinder Knox car, it is not by any means the smallest car in the line.

There are two four-cylinder models included, both of which are rated at 40 horsepower, the bore and stroke being in each case 5 x 5½ inches, the bix "six," rated at 60 horsepower, in which the bore and stroke is the same as in the fours, and the new "little six," which is rated at 46 horsepower and which has a bore and stroke of 4⅜ and 5½ inches, respectively. Because the older cars in the line have suffered so little alteration as to be scarcely noticeable, it may be taken for granted that no room for improvement could be found in them. Improvements have been made, as a matter of course, and minor refinements, but in the main they are the same Knox creations that have rolled over the roads for several seasons past. It is but natural, therefore, that chief interest should attach to the new model, because it is new and also because it incorporates a number of features never before found in Knox cars.

In bringing out the new "six," it is explained by H. G. Farr, who for practically the whole life of the company has been its chief engineer, it has been sought to develop a "balanced" motor and chassis that would permit continuous touring over all kinds of roads, good, bad and indifferent, without the necessity for frequent gear shifting. Though an exceptionally speedy creation was not sought, it is modestly admitted that with the car in touring trim 73 miles an hour has been attained. The search was rather for high torque at low engine speeds—obviously, continuity of torque has been obtained by using six cylinders—which is the only feature that will permit of long, hard pulls through deep sand or up steep hills on "high." Cognizance has been taken of the fact that not every one likes to "rush" hills, and that even when they do it is not always perfectly safe to do so. The alternative, of course, is to use a lower gear, though the necessity for this expedient has been removed in the new Knox "little six" as much as it is possible ever to eliminate it.



TWO VIEWS OF THE NEW KNOX "LITTLE SIX" SHOWING V-TYPE RADIATOR



KNOX 7-PASSENGER BERLINE

In the course of an afternoon's demonstration of the ability of the car, a portion of one of the worst hills in the vicinity of Springfield—the gradient is said to be well over 20 per cent.—was negotiated on high gear without the slightest difficulty and at moderate speed. There was no necessity to rush at the hill, and, what is perhaps more to the point, there was absolutely no laboring of the engine. Even when the engine was all but stalled on one exceptionally steep spot, which would cause many another engine to complain even if the intermediate gear were used, the slight pound which generally is apparent, and which legitimately may be looked for, was conspicuous by its absence. The first sensation almost was one of disappointment becaues the engine buckled down to its work without a sign of the tremendous strain upon it, but it quickly changed to one of admiration for the pulling power and the quietness of the power plant.

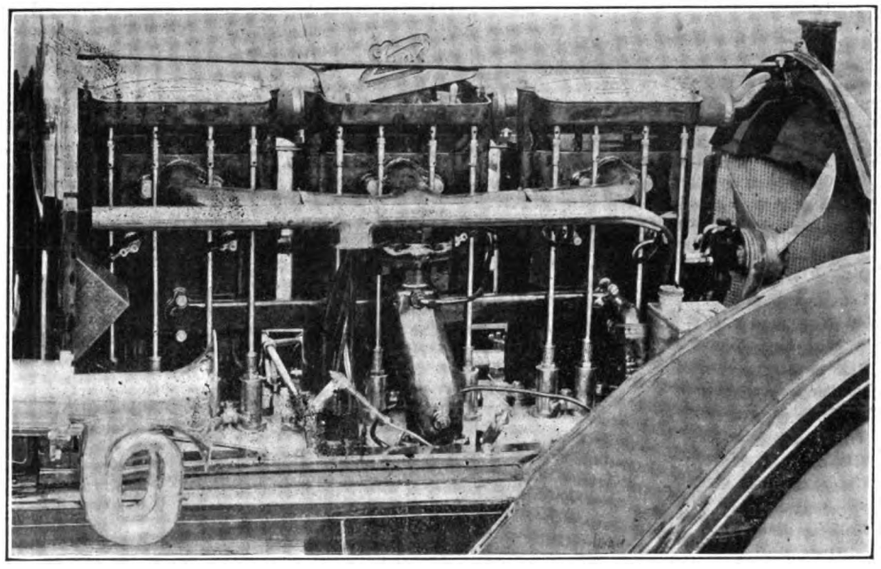
It was the same way on the straight level stretches that lie just outside the city. There was the sense of exhilaration that is given by almost any six-cylinder motor coupled with an acceleration and pulling power at low speeds that was nothing short of astonishing. Time and again the uncomplaining motor was throttled down until the car crept along at snail's pace—on high gear, of course—and it was easy to count every explosion, or, rather, to count the firing of the cylinders by the sound of the magneto contact breaker. In fact, there was little else to indicate that the motor was running, and another unusual feature was that it was virtually as quiet at 60 miles an hour as it was at 20 miles an hour.

In explanation of the great pulling power at low speeds and the rapid acceleration, it is merely necessary to examine the dimensions of the bore and stroke, which are 4⅜ x 5½ inches. Here, though the long-stroke principle has been adhered to, there has been no attempt to carry the ratio of stroke to bore to the extreme, as has been done in so many other cases with results which, in the minds of not a few, are doubtful. Instead, the ratio has been maintained on the conservative side, and the wisdom of the designers amply is reflected in the performance of the car. Of course, efficiency of carburation and scavenging of the burned gases has no little to do with the problem and this, too, has been attacked in a manner that suggests the care in designing that everywhere else is apparent. The intake

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manifold is short, as may be seen in the accompanying picture, and it is completely water jacketed. The gas, therefore, is warmed before it enters the cylinders and becomes to all intents and purposes a perfectly homogeneous mixture which burns completely and quickly. The completeness of combustion is indicated by a total absence of smoke or obnoxious odors at the exhaust pipe.

The location of the two manifolds, by the way, is quite different in the new model. Instead of being both on the same side, they are separated and are on either side, the change being made to permit the option of either right or left hand position of the steering wheel. The emergency brake and gear shift levers are located in the center of the footboard in any case. Another noteworthy difference between the new-



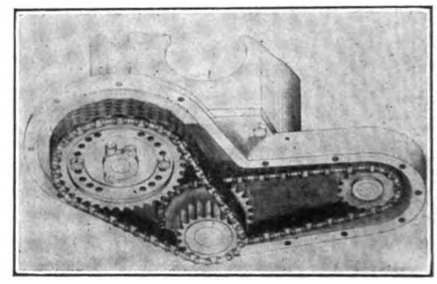
KNOX "LITTLE SIX" ENGINE SHOWING NEW VALVE COVERS

comer and the older "six," and one which in no small way effects quietness of operation, is that the overhead valve mechanism is completely enclosed by means of light, removable aluminum casings; they are shown quite clearly in the accompanying picture.

This feature is merely by way of quieting such slight valve noises as are necessary and cannot be eliminated by the most careful designing. In the method of driving the cam shaft and magneto shaft, however, a preventive of noise rather than a cure is employed and is in the form of a "silent" chain. In this connection it is interesting to note that in choosing the size of the chain to use, the designers were not content to abide by the recommendations of the chain manufacturer, but conducted their own experiments to discover the best size to use under all conditions. The result was that a chain of 50 per cent. greater load capacity than that recommended by the manufacturer finally was adopted. Indicating the forethought of the designers in this respect, after an exhaustive test during which the car was driven some 10,000 miles, the "stretch" in the chains was so small as to be negligible. Despite this fact, however, provision for taking up such slack as may result from wear is made, the Vernier adjustment showing in the picture.

Part of the standard equipment on both the six-cylinder models is an Esterline dynamo electric lighting system. On the new "six" the dynamo is driven from a continuation of the magneto drive shaft, leather universal joints being interposed between both the magneto drive and the dynamo drive. The magneto is the latest Bosch instrument and forms part of the Bosch ZR6 system. The principle feature of the magneto is that it is completely waterproof and therefore impervious to the unwelcome attentions of careless washers and to the elements. Cooling is effected by a positively driven centrifugal pump and a liberal sized radiator, the most noteworthy feature of which is that it is of the V-type, which bids fair to appreciate materially in popularity in the near future. Outside of reasons of a strictly esthetic nature, the new style radiator has been adopted because it permits slightly greater cooling surface and its shape is such that the suction through it is uniform over practically its entire surface. The lubrication of the engine is the same as that which has been used with conspicuous success in all Knox engines for a number of years. Under the system, the oil is forced under pressure to all the main and auxiliary bearings and is maintained in constant circulation by means of a pump located outside the crankcase, where it is instantly accessible.

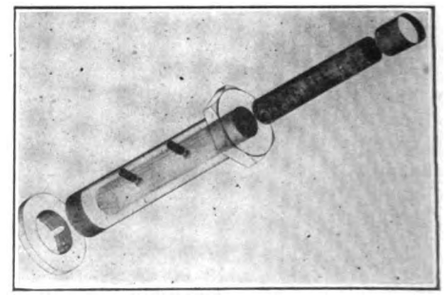
The remainder of the chassis differs little from standard Knox practice, except for a number of refinements and minor alterations, which, though small, nevertheless have definite bearing on the car as a whole. Thus, for instance, though the change gear mechanism is of the same three-speed selectively operated type that has been used for years, and now is used in all the Knox cars, a slight variation has been made in the length of the lay shaft in order that the speedometer may be driven from it. This position of the star wheel, it is explained, permits more accurate driving of the instrument for the reason that no amount of wheel bouncing can effect the reading or cause the dial hand to oscillate. Incidentally, the ordinarily rapidly rotating gears are fully protected from the influence of road dust and dirt, and therefore run for



CAMSHAFT CHAIN DRIVE

practically indefinite periods without wear and without attention.

Another slight difference lies in the method of spring bolt lubrication. The bolts themselves, as may be seen by the picture, are unusually large and provide the maximum of bearing survice. By way of reducing wear and consequent rattles, the bolts are drilled out for two-thirds of their length, with smaller holes leading to the bearing surface. The small holes are plugged with felt and a roll of the same material thoroughly soaked in heavy oil is inserted in the large drilled passage. A



SPRING BOLT CONSTRUCTION

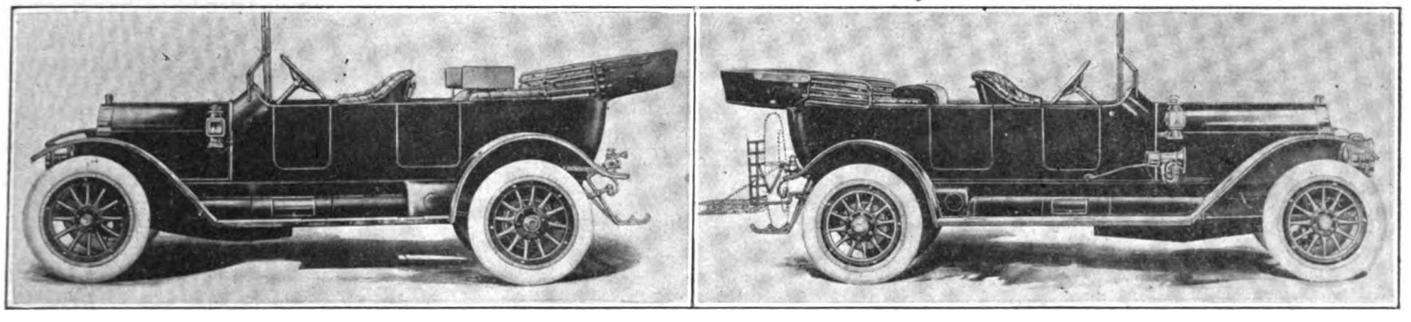
movable plug at the end serves to maintain the felt in position and also to force the lubricant to the bearing surface.

Power is transmitted to the change gear mechanism through the intermediary of the well-known Knox three-plate clutch, the smooth action of which is ensured by cork inserts. The drive is by propeller shaft in a practically straight line to a new form of full-floating rear axle, which differs in several respects from the axles which have been used in Knox cars in the past. In the first place, the axle is of Knox design and construction and in appearance suggests light weight combined with a ruggedness that is unmistakable. One of the particular features of the design is that all load is carried on annual ball bearings, which are

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backed up with thrust bearings. It is to this construction that the designers lay the axle's smooth action and freedom from all noise. To the unpracticed ear, it would be difficult to determine at 50 miles an hour whether the driving gears are of the orthodox bevel type, which they are, or whether a worm drive is used, so silent is the construction.

The spring suspension is the same in the new model as in the older ones and remains unchanged, the leaves of the upper portion of the rear three-quarter elliptic members being extended slightly to act as buffers against rubber pads placed on the axles. The front springs are of the semi-elliptic variety and, like the rear springs, are of the proper length to provide the requisite resilience without undue rebound; Truffault-Hartford shock absorbers are regularly fitted both front and rear. The wheelbase of the new car is 130 inches and the wheels are shod with Fisk demountable rims and 37 x 5 tires all around.



TWO KNOX TORPEDO MODELS—4-CYLINDER 45 HORSEPOWER AND 6-CYLINDER 60 HORSEPOWER

The new car lists at $4,350 with any style of open body, $100 and $150 being added for limousine and landaulet types, respectively. The equipment which is included for the price is unusually complete and numbers such items as top, windshield, speedometer, electric light system complete with all the necessary lamps, power driven power pump, acetylene engine starter, gasolene tank gauge, tire carriers and trunk rack, tools, jack, repair parts, etc.

The older cars in the Knox line remain substantially the same, as already has been told, and include the models 45 and 46, both of which have four-cylinder motors rated at 40 horsepower and having cylinders which measure 5 x 5½ inches. The six-cylinder 60-horsepower model has the same bore and stroke and, like the others, is furnished in a variety of body styles, ranging from a two-passenger "raceabout" to a seven-passenger Berline limousine. On any or all the models, the option of either nickel or brass finished trimmings is given, and the list of stock colors in which the cars are finished is of such variety as to leave little to be desired. The distinctive body designs which have been a striking characteristic of Knox cars during the past season are continued with several detail improvements that tend toward greater harmony of outline.

STEARNS STAFF "SEES THINGS"

Visits Factory for Annual Conference, when New Models and New Plans Are Disclosed—Record Orders Booked.

Marking the first anniversary of the birth of the Stearns-Knight car, the F. B. Stearns Co., of Cleveland, O., having elected just one year ago to equip all its cars with the Knight engine to the complete exclusion of all other types, the annual convention of its distributors and sales managers, which took place last week, was the largest ever held in the experience of the company, and among other things served to bring to light several new features which have been adopted for the new series of cars which soon will be ready for the market. So convincing were the models disclosed that the number of contracts closed for immediate delivery totaled the largest single week's business ever done by the company.

Though the cars will be continued in practically the same form as has enabled the Stearns company to double its business since its adoption of the Knight engine, a number of slight, though nevertheless important, changes have been made. Thus, for instance, the finish hereafter will be in nickel plate and black enamel instead of in brass. Another change which was disclosed was that the already complete equipment of the cars has been made still more complete by the addition of a self-cranking device. The remainder of the equipment remains the same and includes top, windshield, speedometer, dynamo, electric lighting system, electric horn, demountable rims, etc. The position of the tire carriers also has been altered; they now are located at the back of the tonneau, the clearing of the running boards being completed by the relegation of the tool boxes to less conspicuous positions beneath the seats.

The convention was opened by President Frank B. Stearns, who made a short address that was followed by others from Secretary McEwan, T. A. Boyle and H. H. Hower. On Tuesday night, 9th inst., the visitors and heads of departments of the home office were entertained at a banquet given by President Stearns at the Cleveland Automobile Country Club, at which the future plans of the company and many of the phases of the business peculiar to the marketing of Knight-engined cars were discussed at length.

Rambler Increases Disclosed at Conference.

At the annual convention of salesmen of the Thomas B. Jeffery Co., which occurred last week at the Kenosha, Wis., factory of the company, the most important piece of news that was imparted to the 75 men who had gathered from all parts was that the factory output next year will be increased by 60 per cent. In the report, which dealt with the subject, it was brought out that the increase in the sales of the Cross Country model, the Rambler leader, amounted to 126 per cent. more than the sales that were made for the corresponding period the year before. The actual number of cars shipped from the factory showed an increase of 20 per cent. over the best previous year. Incidentally, Rambler dealers have increased more than 100 per cent. during the past year.

Australia Increases Its Automobile Imports.

It is doubtful if there are many who appreciate the position that Australia occupies with regard to the automobile industry or the importance which attaches to that country's steadily increasing importation of automobiles and parts. For instance, in the year 1911 the eight states imported automobiles, including pleasure and commercial vehicles, and accessories, to the value of $6,185,090, of which the state of New South Wales, which took almost as much as the other seven states combined, took $2,645,120 worth, leaving $3,539,970 for the others. Naturally, the greater portion of the importation came from Great Britain, though America is next, and within the past year has displaced France for second. The value of cars imported from Great Britain was $2,738,930, as against $1,302,385 from the United States. As indicative of the strong demand for American-made cars and trucks, New South Wales alone took $641,970 worth of American products as against $1,163,500 worth of British products, both figures representing a substantial increase over those for the similar period last year.

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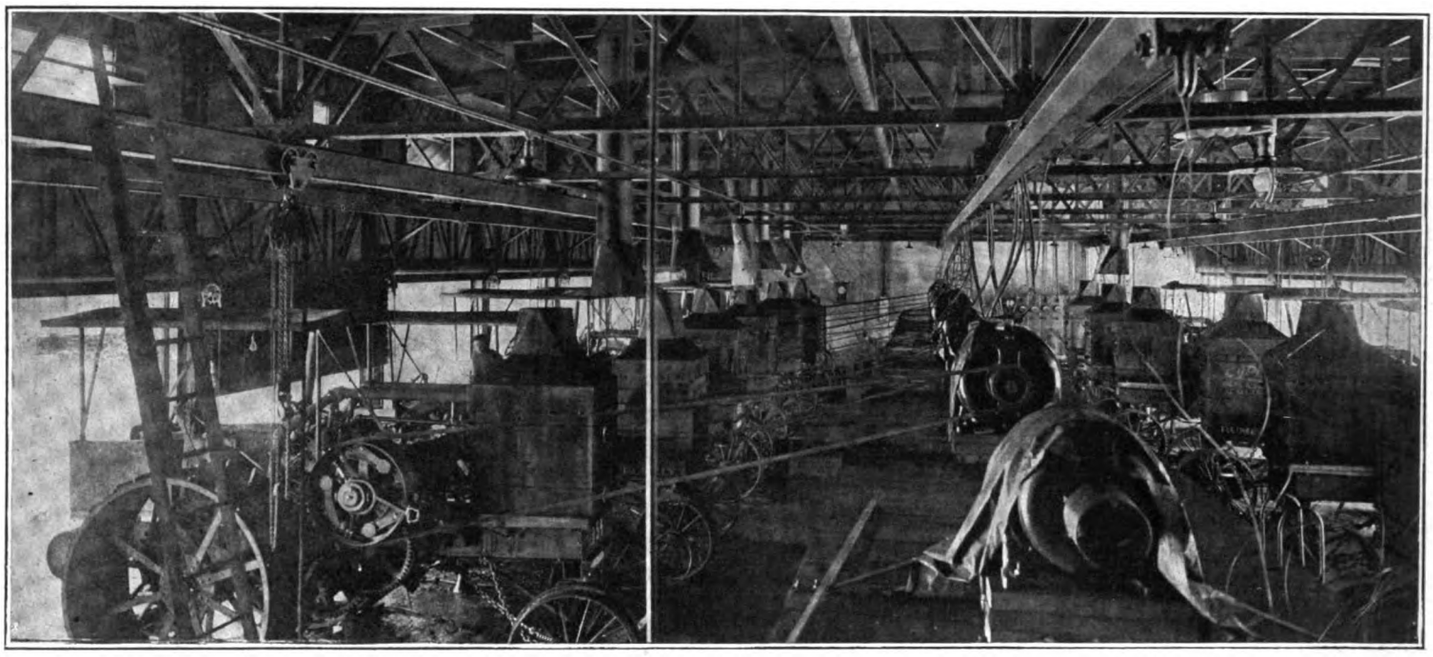
WASTE POWER THAT IS PUT TO USE

Factory in Which Engine-Testing Operations Are Made to do Double Duty—How the Purpose is Attained.

There are few industries to-day to which the application of scientific management in some form or another is not possible; and where it is applied, the results almost invariably prove beyond cavil that in the conservation of energy with the least waste and the most direct application of efforts lies the real secret of success in almost any endeavor and certainly in every business. A clever instance of the forethought and attention to detail that lies back of the principle is to be found in the La Porte (Ind.) shops of the M. Rumely Co. whose farm implements and agricultural tractors are known wherever such things are used. It consists, briefly, in putting to useful purpose power which ordinarily and every day in hundreds of factories deliberately is thrown away.

It is needless to point out that every engine that is completed must undergo a certain "course of sprouts" and be run for a certain length of time on the testing stand. Under the usual order, the power that is developed during the time the test is in progress is considered valueless except to give readings and to "run in" the motor. It remained for the Rumely company, however, to put this power to other and more specific uses; it is employed to drive other machinery and to generate electric lighting current, and so successful has the experiment proved that savings represented by figures of four digits are effected. Incidentally, though but part of the available power is used at present, it is planned in the near future to increase the size and facilities of the testing house so that all the power utilized in the manufacturing plant can be drawn from engines that are undergoing tests.

The method of utilizing the power is plainly apparent from the accompanying illustration, which shows the company's present testing house and a number of its kerosene-burning agricultural tractors belt connected to dynamos undergoing tests. The test house, which is of steel and concrete construction, is 168 feet in length by 62 feet in width, and is fitted with a central platform on which are mounted eight 30-kilowatt generators which are belted to the motors of as many Rumely "Oil-Pull" tractors. The motor of each tractor is "run in" for at least 48 hours and the electric power generated is utilized and effects material savings in fuel bills. After the two days' run, the tractor is shifted to the other side of the platform and connected with a water brake for a final test and horsepower reading.



HOW THE RUMELY CO. HARNESSES THE POWER GENERATED AND USUALLY WASTED IN ENGINE TESTING

Vanderbilt Suit Involves Second Maker.

Although the denial by Judge Benedict in the Supreme Court for Kings county, N. Y., of a motion by the Pope-Hartford Auto Co. of New York City to retry the case brought against it by Thomas Muller, who was injured in the 1910 Vanderbilt Cup race, is a temporary setback for the defendant, the October term of the Appellate Division of the Second Department may be productive of results more favorable to the Pope-Hartford concern, for at that time two appeals will be argued, one from the order denying a retrial and the other from a verdict of $22,500 previously secured by Muller. Both probably will be heard together, as, while the motions are separate, they are alike in interest and affect a single legal action. The new evidence involves another car and maker.

Muller was struck by a car and was badly injured and brought suit against the Pope-Hartford company, claiming that its entry, driven by Jack Fleming, was the offending vehicle. The jury in the first trial agreed with Muller, but after the trial the Pope-Hartford company unearthed additional evidence supporting its claim that Muller was mistaken in his identification of the car which struck him and asked a retrial, supporting its motion with affidavits by Joe Dawson and his mechanician, who rode the Marmon entry, that the Marmon car struck a man at the point where Muller was injured. The Pope-Hartford car, the claim is, was drawn up at the roadside, some distance away, repairing a tire at the moment the accident occurred.

Seek to Escape "Gasolene Barons'" Grasp.

As a means of escaping the grasp of the men who control Great Britain's gasolene supply and to provide the fuel at reasonable rates, an effort is being made to form a co-operative "Petrol Supply Association" composed of car owners. The scheme embraces the formation of an organization with a capitalization of £25,000, the shares to be £1 each. The promoters of the association declare that the condition of the private owner is "absolutely helpless" and that co-operation offers the only avenue of relief. They believe it is possible to supply gasolene at a price not exceeding 24 cents per gallon, which price, they maintain, will, at the same time, give the members of the proposed association a fair return on their capital.

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PARTS DRIVERS MAY PLAY IN INFLUENCING TRUCK SALES

Two Instances Drawn from Real Life Which Strikingly Illustrate Conditions That Are Encountered—The Employer, Willing to be Convinced and Yet Loyal to His Old Horse Drivers, Who Remained Unconvinced, and the Reasons Therefor.

The Designing Engineer was sitting on the small of his back with his feet on the desk, reading a somewhat lengthy letter that caused his face to assume an expression indicating feelings too deep for ordinary words, and ever and anon as he read he gave his head an impatient jerk to one side, as if to make special note of those parts of the communication that caused him the most annoyance. When he had read it through he turned back and started again, and it was at this juncture that his friend the Inquisitor, ignoring the diminutive office boy, shoved the door open and entered with his usual lack of anything in the nature of ceremony.

"Well, how's the D. E. and the theory of intermolecular animalcules?" he jollied. "What's the latest in—— Why, old top, what's up? Haven't you paid your bills?"

The D. E. glared at his visitor for a moment without speaking and then once more cast his eyes on the letter in his hand.

"That's what's up," he replied, sourly. "If you can be rational for a few minutes and stop making fool remarks you can read it and sit with me awhile and help me swear. My individual ability is unequal to the occasion."

The Inquisitor read the letter, and as he did so his face lost its ordinary expression of jollity, for the two were close friends, and anything that touched the D. E. touched the Inquisitor also. The letter was from a big contracting firm for which the D. E. had planned a somewhat extensive installation of motor trucks, and was to the effect that the work done by the single machine that had been installed as an experiment in order to get a line on what the truck could do, had made such a poor showing that it had been decided to postpone the purchase of a fleet until some future—and very indefinite—time; that the firm believed thoroughly in the future of the motor truck, but was firmly convinced that the experimental period was still unfinished, and so forth and so on. Later they would be pleased to re-open negotiations—"Like h—l they will!" muttered the D. E.—and in the meantime they would be pleased to know what price they could obtain for the machine on hand, which was really in very fair condition, having done comparatively little work.

"Rotten!" ejaculated the Inquisitor, feelingly, after he had mastered the contents of the letter. "Rotten, with trimmings and extras on the side! But why didn't you put in a machine that would do their work? They seem to be afflicted with a regular old canal-boat on wheels."

"That's just the rub," replied the D. E., gloomily. "It's a good machine, and it can do their work all right, and we would have landed them for a fleet of at least eight or ten if it hadn't been for the question of drivers. That's what killed the whole business."

"Drivers!" exclaimed the Inquisitor. "I thought any idiot could drive a truck."

"No. Not any idiot; only some brands of idiot." By this time the D. E. was sitting on the back of his neck with his feet among the pigeonholes—his favorite attitude when dejected. "I'll tell you the whole horrible tale and get it off my chest.

"You know, I have nothing to tie me to any particular manufacturer unless I believe in his machines and think they can make good under proper conditions—which means that I can sell them so that they will stay sold. Now, I learned that Jones, the senior partner of the firm of Jones & Co., had been evincing a great deal of interest in motor trucks and that he had even gone so far as to allow himself to be approached by one or two salesmen. I saw him myself, wormed out of him a lot of information, and managed to work out a set of figures that really made things look good for motor trucking. Naturally, I know what my machines will do in work of the sort Jones & Co. are engaged in, and I was able to show the old man something that gave me the inside track. He consented to put in a machine just to see how it would run, and if it did well he would put in a fleet.

"He was very particular on one point, however. 'We have a force of men who have been with us for years,' he said, in his pompous way, 'and I won't have them thrown out. The only way to keep them is to train them to drive the motor trucks. That can be done, can't it?' I assured him that if the men were of the right sort it could be done. 'All right,' he replied. 'When the machine is ready let me know and I'll have a man picked out for the job.' Well, I wish you could have seen the man. He may have been all right as a driver of horses; probably he was born and brought up in a stable and couldn't help being a good man in his proper field. But as a motor truck driver he was absolutely hopeless. The machine is a battery truck. Every time Tom moved the controller handle he muttered 'Whoa!' or 'Giddap!' as the case might be, and in an emergency he would pull backward on the steering wheel and yell 'Whoa!' and sit and wait for the car to stop. At first he showed a strong desire to understand all about the motive power, and I believed he was in earnest. I tried to show him the way to read the meter and how to figure his volts and amperes and kilowatts. But I got no further. It seems that he had an inveterate hatred of Italians, and the moment I pronounced the word kilowatt he pricked up his ears. 'Kill-a-wop?' he howled, 'Kill-a-wop? You bet! Haw, haw! Ho, ho! Kill-a-wop! That's the name of this here machine.' And that was as far as I got, for he refused to do anything but roar at his own joke and immediately lost all his pretended interest in the meter. Finally I had to go to the old man and explain as diplomatically as possible that the man probably would do all right when he had had enough training, but that it would take some time to get horses out of his head and that a man ought to be put on who could pick up the work quickly. Old Jones looked at me with unfeigned suspicion.

"'I thought you said any man could drive your machines?' he said, looking at me over the tops of his spectacles. 'Tom's team is the best team in the stable; he can't be a fool or he couldn't keep them in good shape and get the work out of them that he does.'

"I tried to explain, and finally Jones consented to give me another man, but he didn't like it at all, and I could plainly see that he was disgruntled. The new man was an improvement, and so far as the actual driving of the machine was concerned he was all right; but his trouble was that the slightest thing out of the ordinary robbed him of all his wits and he could not think, though he never was at a loss when anything went wrong with his horses. But the deposed driver immediately began to make trouble. He told the new man that I was part Italian because I got him 'sacked' when he joked about 'wops,' and that made it hard for me. The men cared nothing for the truck, for though they had been told that if more trucks were installed they would be put on as the drivers, they were of a suspicious turn of mind and were inclined to believe that they would be fired and replaced by chauffeurs—a belief that the first driver helped along considerably, holding himself up as an example.

"To make a long story short, I couldn't get a thing done with the truck. It was abominably treated when my back was

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turned — smashed against string-pieces, pounded over railroad tracks in the yards, where a good deal of work had to be done, run for miles with the brakes partly on—all with a low cunning that was admirable, in its way. The reports of the men and the foremen were that the truck was all right when there was an expert handling it, but that it was too blankety blank delicate, for when a strong man touched it something busted. Old Jones believed his men and refused to believe me. 'The thing's broken,' he would say, 'and the driver says it just let go while he was running along an ordinary street. Why should he lie about it? It's to his advantage to get a better job if he can, and he would get more money as driver of the machine than of horses. Seems to me the machine is too weak.' I tried being perfectly frank and explaining the situation exactly as it was; but the old duffer kept up that everlasting cry, 'Why should the men try to spoil good jobs for themselves?' I tried to get him to let me put my own man on, and he went so far as to consent to week's trial; but at the termination of a first class six days' work he informed me that he was convinced that while the machine would do well in the hands of an expert, it was no good in an ordinary man's hands, and he couldn't afford to pay mechanical engineers to haul his stuff.

"Well,—well, here's the result!" The D. E. flipped the letter disgustedly onto the desk, removed his feet, straightened up in his chair and looked at the Inquisitor with a what-would-you-do-about-it air.

"It reminds me, in a way," said the D. E., after waiting for comments and getting none, "of another case where the driver problem made trouble; but this time it ended differently. You know Wilson, of the Empire Emporium? Well, that's the man. He's rather excessively good-natured and sometimes it's taken advantage of. He needed a big truck for his wholesale delivery work, and as there was a good deal of long-distance work I sold him a gasolene machine on condition that if it could not be made to show a saving in excess of a stipulated amount I would buy back the machine for the original price minus hire for the time it was in use and an allowance for wear and tear. The conditions suited me all right, because I knew the truck was well able to do the work. Wilson agreed to hire a good man, let me pass on his qualifications and work him under my demonstrator for a week or so. That certainly sounded most satisfactory.

"Wilson, in casting about for a man, applied to one of his old cronies, who instantly recommended his brother-in-law who, he informed Wilson, had been a mechanical engineer but had lost his health and was consequently in reduced circumstances, and willing to take any sort of a job for a while, and so on. Incidentally, he had recovered his health. He knew how to drive, for he had once owned a car of his own. I talked to the fellow and found him remarkably intelligent—I believe he knew more about cars than I did, in fact. I couldn't understand why he was looking for a job as chauffeur, but he certainly had the necessary qualifications, and after seeing him run the truck for a trip I agreed most heartily to his engagement. I sent my man with him for a few days only, and congratulated Wilson and myself on having made a find.

"I wasn't long before queer things began to happen. Three times in one week old Graham got stuck for gasolene, and another time his motor ran out of oil and reached the garage on the point of 'freezing.' On two separate occasions he telephoned my office that something that he was unable to locate was interfering with the proper running of the motor, and wouldn't my man run down and have a look? He had been working nearly all night the night before and was going to get a little rest. On both occasions my man went down and found little fool things, such as cracked spark plugs, or ignition wires disconnected, or something equally trivial—I forget just what, but things that old Graham could have found and fixed with both eyes shut and his hands in boxing gloves.

"The indications pointed to booze, according to my way of thinking, but the old codger was never seen under the influence of liquor, and there was nothing in his appearance or even in the smell of his breath to indicate that he imbibed. I tried to catch him, but couldn't. The engine had a good many queer spells in the meanwhile, and Wilson didn't like the frequent and inconvenient delays. I tried to explain the matter to him, but he had such an abiding faith in the man who recommended Graham that I could make no impression whatever on him. So I 'laid down' and waited for a chance; I was becoming more certain that Graham was hitting it up on the quiet, for as winter weather came on the engine showed more and increasing crankiness. I had several more or less disagreeable interviews with Wilson, who finally became exasperated and wound things up by saying that in his own private opinion the d—d truck was no good and that I was trying to make a 'goat' of the driver; but that if I could prove my suspicions to be correct he would bounce Graham on the spot and let me put in a man myself.

"That sounded pretty good to me, and I waited and schemed; but, as it happened, I might as well have saved myself the trouble of making plans for the downfall of Graham. One bitterly cold day Wilson's operating office received a telephone message that the truck was at such and such a street, broken down, with the load still on board. It happened that there was no one in the Wilson office who was of any use in such an emergency, so they telephoned to me. I got my things on and posted up to the place as fast as I could travel, and what do you think I found?

"The truck was standing at the curb, a quarter of a mile from its destination, and Graham was nowhere in sight. Investigation proved that the engine cylinders were rusted red, as if they had been in a hot fire; it was stuck hard and fast and the crank failed to budge it. Also, all the water in the radiator was frozen solid, which had knocked the cooler galley-west, and two of the cylinders were cracked from the same cause. I hunted around for Graham, but he was not to be found, and no one had seen him since the truck arrived, three hours earlier. Leaving a couple of teams to transfer the load, I found out where the driver lived, went there and found him in his room, asleep with his working clothes on and snoring the snores of the very drunk. Just to be mean, I got Wilson to come and look at him where he slept, and the old man was so mad that he tried to wake up his erstwhile favorite to fire him, as promised, on the spot; but it couldn't be done, so the discharge was written to a slip of paper and pinned to Graham's shirt. Graham was never seen again, so far as I ever heard.

"We had the truck towed home and found that it had been run without water and without oil—not a drop of either—until the cylinders had overheated and the pistons seized. Then Graham dumped in some water, but, of course, couldn't start the engine, so he went and got a drink to fortify himself for further exertions, and it took so long that the engine cooled off to the freezing point. Graham, according to a witness, took one look at the motor and then made straight—or, rather, as straight as he could—for home. All the cylinders of the motor were destroyed, the bearings throughout the motor cut to pieces, the crankshaft scored so deeply in the bearings that it was good for scrap only—there was nothing left that was any good but the crankcase and the magneto. It meant a whole new engine and a new radiator.

"Wilson came up like a little man; bought a new engine and radiator, paid for having them put in and had the truck generally overhauled at his own expense—not that he shouldn't have done all this, but the point is that he did it cheerfully, which is more than most people will do. I put a man on and the old mill has been working like a top ever since, and if nothing happens I'll sell a couple more to Wilson within the next few weeks. And now when I talk Wilson always listens with both ears."

"Well," said the Inquisitor, waiting for a moment after the D. E. had stopped talking, "what's the moral?"

"The moral is that when a man who has tried a truck says it's no good, you can't always tell from what he says whether it is or not," said the D. E.

Using Rosin to Aid Soldering Operations.

Common rosin dissolved in turpentine makes an excellent soldering fluid, and one that is particularly useful in electrical work because it will not corrode the metal upon which it is used. It may be applied with a little swab on the end of a stick.

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PULLMAN ADDS POWER AND COMFORT

Refinement Carried Out Along Those Lines —Wherein the "Fours" and the "Six" Show the Good Results.

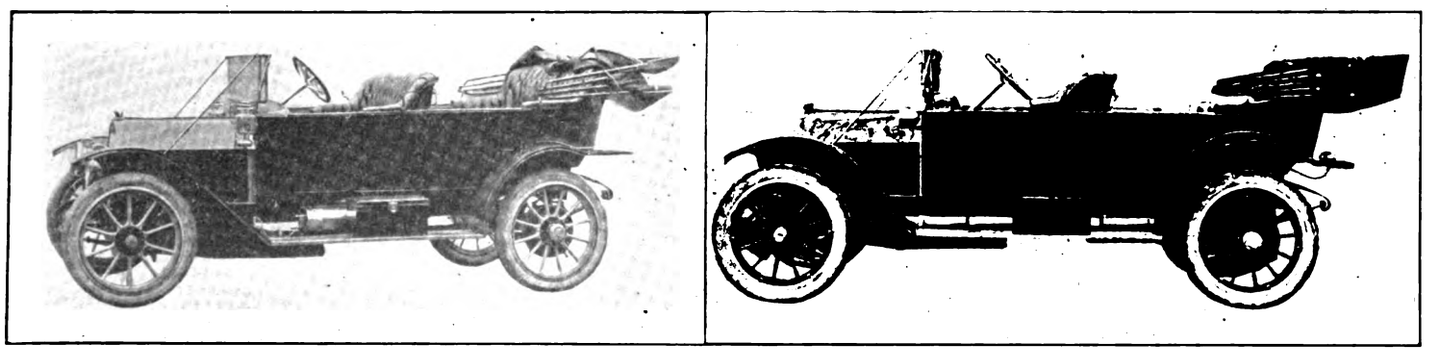
As is but natural in the productions of a manufacturer whose cars have earned a reputation for themselves, Pullman cars of the newer series that will go to make up the line for the coming year have changed but little from their immediate predecessors. A general refinement has been made, as a matter of course, in which the manufacturers, the Pullman Motor Car Co., York Pa., have centered particular attention on the spring suspension of its cars. To this end all springs have been lengthened and the three-quarter elliptic rear springs which have served in the past have been changed to scroll three-quarter elliptics, and this constitutes practically the only material alteration that has been made.

As heretofore, four chassis are included in the line; three of them are four-cylinder models, and the fourth is the six-cylinder model which made its initial appearance late last Fall, just prior to the national shows. In line with slight increases in power which have been made possible by the smoothing down that has been effected, the designation of two of the four-cylinder models, the 4-30 and the 4-40, has been changed to 4-36 and 4-44, respectively. The six-cylinder model also has been newly christened, for the same reason, and hereafter will be styled 6-66.

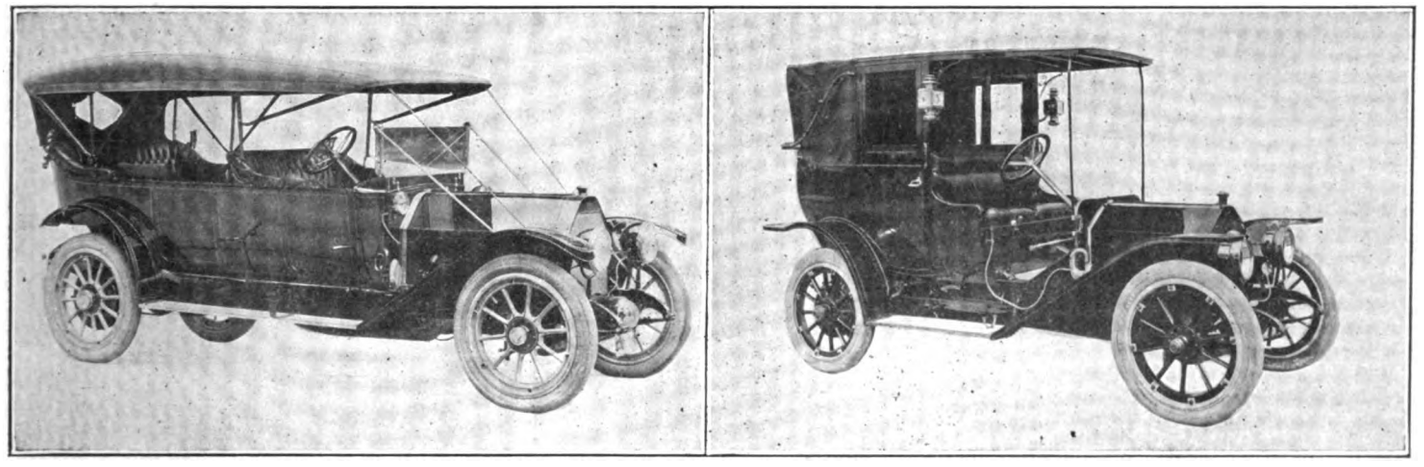
The motors in all four chassis follow the general lines that were laid down by the Pullman company several years ago, no reason for change in design or construction having been found. All have their cylinders cast in pairs, with the valves, which are on opposite sides, carefully enclosed further to reduce valve noises and to prevent the ingress of dust and dirt and other objectionable matter. The bore and stroke in each case remains the same, the measurements being 4 1-16 x 5 for the 4-36, 4½ x 5 for the 4-44 and 4½ x 5 for the 6-66. Valves, however, have been slightly increased in size, which accounts in a measure for the increase in power available. No little of the increase, however, is due to the modified oiling system which has been adopted, and which, it is calculated, will effect material savings in oil while at the same time ensuring efficient lubrication and the absence of smoke. As heretofore, lubrication is by the automatic level splash system. But the eccentric pump which circulates the oil and maintains the splash compartments full now is regulated from the dash instead of from the side of the crankcase, as in the past. Thus it is possible for the driver to increase or decrease the supply of oil to the crankcase to suit the requirements of engine speed without the necessity for stopping the car or leaving his seat. Incidentally, the oil capacity in all the models has been increased.

Another of the factors which has a direct bearing on the increase in power which has been made possible concerns the reciprocating parts, which all have been lightened, particular reference being made to the wrist pins. Such lightening as has been effected is such as to leave an ampler factor of safety, however, and its only effect is one which genuinely may be classed as beneficial. Cooling is by water, circulated by a positively driven centrifugal pump; except for a slight increase in the size of the radiators in all models, whereby the water capacity is made greater, no change has been made in the system. Ignition is effected by Bosch high tension magneto exclusively, the system being of the well-known dual type that has become familiar by reason of its widespread adoption.

On the two larger models, namely, the 4-44 and the 6-66, the complete electric lighting system which last year was adopted is retained substantially without change. That is to say, there has been no change in the component parts, though the method of driving the generator has been made more positive and now is effected by means of a chain of the "silent" type. The electric tire vulcanizer which forms an item of equipment on the 6-66 and is an exclusive



TWO PULLMAN 4-CYLINDER MODELS IN THEIR LATEST FORM—THE "4-36" AND THE "4-44"



PULLMAN "6-66" IN TOURING TRIM AND THE "4-36" WITH SMALL LANDAULET BODY

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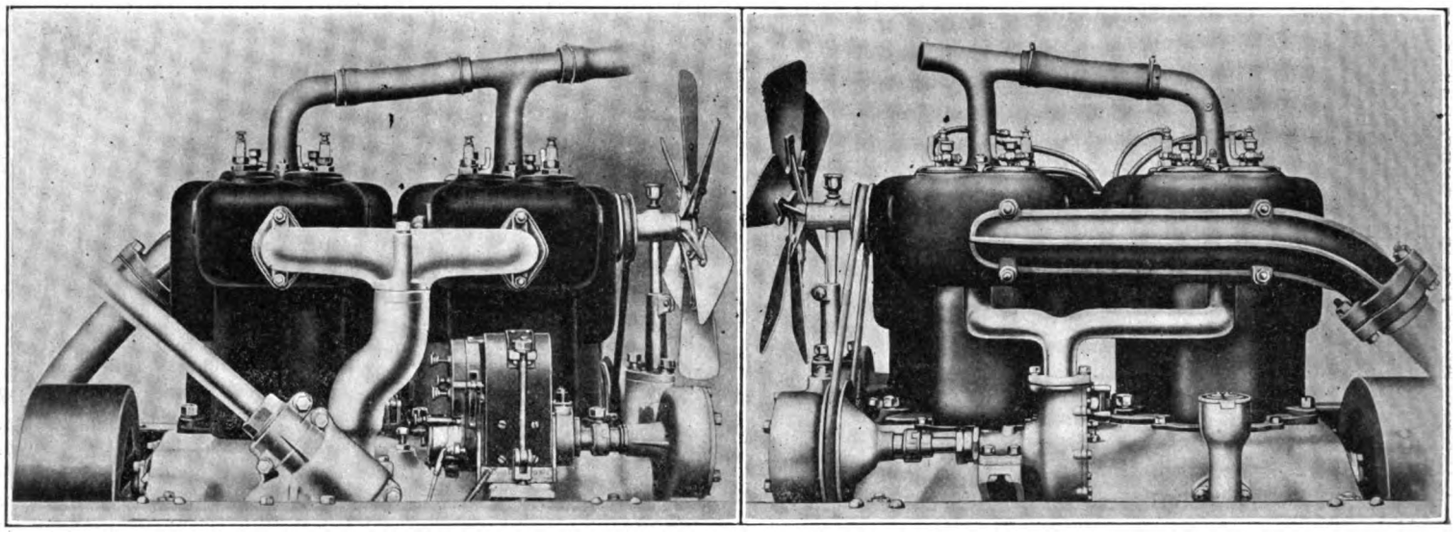
feature of the Pullman line is retained. The remainder of the electric equipment includes the usual complement of head, side, tail and dash lamps. The carburation system remains unchanged, except that a dash priming device has been added. All the motors are equipped with starting devices.

The similarity which obtains in the case of the motors is continued through the remainder of the cars, the only difference being in the wheelbase, and the size of parts, of course, and in the change speed mechanism. The 4-36 is equipped with a three-speed selective system and the other models all have four-speed systems, the high gear in each case being the direct drive. All models have leather-faced cone clutches of large diameter, the size in the case of the 4-44 and the 6-66 having been increased 2 inches and now being 18¾ inches. By reason of the rearrangement of the springs and other refinements, the drive line has been made practically straight and much power thereby conserved, the saving being effected in no small way by the careful manner in which the pins and blocks of the universal joints and the shafts in the change gear mechanism now are ground to within one-quarter thousandth part of an inch of size.

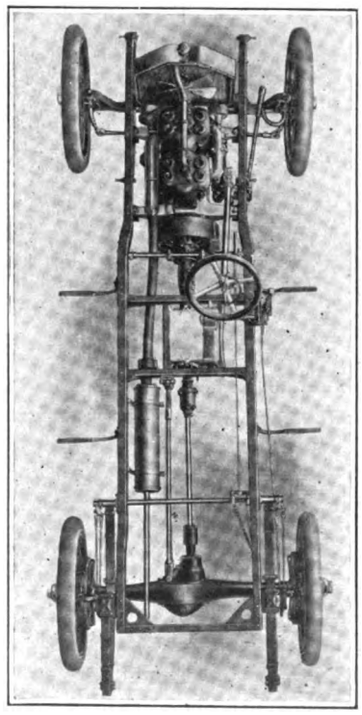
The front axle remains of the I-beam type with Elliott steering knuckles. The rear axle, which is enclosed in a pressed steel housing, is of the standard full-floating type and is mounted in annular ball bearings. Brakes in each case are mounted on the rear wheels and are of the internal expanding and external contracting variety, proper leverage being allowed to reduce the fatigue of driving and ample adjustment for wear provided. Treads, or rather the distance between either pair of wheels, is standard—56 inches—and the wheelbases are 118 inches for the 4-36, 122 inches for the 4-44 and 138 inches for the 6-66.

As regards the bodies, it scarcely will be necessary to point out that they are of thoroughly up-to-date design in which the comfort of passengers has been combined with an attractiveness of outline that is quite in keeping with the mechanical perfection which Pullman engineers have striven for and obtained. Control in each case is from the right side, with the gear shift and emergency brake levers at the driver's right hand. The steering gear is of the semi-reversible worm and sector type, with the engine controls within the periphery of the wheel though separate from it and stationary. On the 4-44 and the 6-66, the diameter of the wheels has been increased slightly to permit of greater leverage and easier action. All the bodies are of wood and metal construction, and on any of the chassis may be had in either roadster, small tonneau, five- and seven-passenger touring, coupe, landaulet and limousine form.

With any of the open body styles the price of the 4-36 remains $1,675, of the 4-44, $2,150, and of the 6-66, $2,750. These prices include complete equipment, as a matter of course, the list being, complete electric light system, top, windshield, speedometer, horn, tool box, foot and robe rails, demountable Q. D. rims and the usual complement of tools and spares. The 6-66, as already mentioned, also carries with it an electric tire vulcanizer for use in conjunction with the lighting system. In the case of the 4-36, the place of the electric lighting system is taken by a Prest-O-Lite tank with the usual complement of gas and oil lamps.



RIGHT AND LEFT SIDES OF PULLMAN 4-CYLINDER MOTOR SHOWING CLEAN DESIGN



PULLMAN 4-CYLINDER CHASSIS

Crook Gives New Twist to Tire Theft.

Great as is the quantity of genius which is every day perverted or thrown away, so fas as any good result is obtained, nothing furnishes more striking illustration of the practice than the criminal world, in which the new schemes constantly being devised to separate someone from their possessions seem without end. Elgin, Ill., for instance, has been visited by a "crook" who, while a tire theft is nothing new, has a peculiarly original twist to his plan of action. The man in question visited Ziegler Bros.' Garage and asked to see some tires, evidently, from later actions, looking for a size or style of which but one or two remained in stock. He found a tire of which the garage had but one and then, of course, said this was just what he wanted; only he needed two. He gave the name of a well known driver as the purchaser, and said he would take the one tire, ordering the other "rushed" over as soon as it could be secured. The second tire was delivered later, to the surprise of the driver, and returned as "not ordered," to the surprise of the garage men. Ziegler Bros. believe the best place to search for their tire would be among Chicago "fences," basing their belief on the fact that innumerable tires so secured were sold in second-hand stores and pawn shops for a small price.

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SYSTEM—AND GOOD COMMON SENSE

Advantages and Disadvantages of too Much or too Little of Either—Also, the Employe's Duty.

The sales manager was mad—not in the good old original meaning of the word which appears first in the dictionary, but according to that popular American colloquialism which indicates a rather high temperature in the vicinity of the seat of emotions; in other words, he was suffering from a serious attack of choler. Mad, in its original and real meaning, was what he applied to the general manager, the officers of the company, the managing committee and nearly everyone else except the sales manager. He didn't tell them so, because that would not have been diplomatic, but having lost his temper he went in search of it and thought the best place to seek that vanished possession would be in the whir and hum of the factory.

As soon as he steamed across the factory yard and neared the test shed the chief tester knew something was wrong, and, as the sales manager exploded with an almost incoherent train of derogatory characterizations of "system," the chief tester smiled. Dipping his fingers into a pail of water, he sprinkled a few drops on the forehead of the angered one and said solemnly, "There, Jim, now you're cooled off." It had its effect, and the sales manager consented to smile, but he simply had to rid his system of the troubles that clogged it.

"What got you into such a stew this fine morning?" asked the tester.

The ludicrousness of the triviality of the cause appealed then to the salesman as he meekly answered, "A lead pencil."

"A lead pencil! Pretty small thing to break up a morning's work, isn't it?"

"It is and it isn't. It's more than that; it's the blamed system in this establishment. Here I want a pencil, and I no sooner go after it than I find the conglomerated fool thing System has taken another new tack. I go to the stockroom keeper for a pencil and he asked me if I had an order. 'Order!' I said, 'what order?' and he explained that I had to have an order from headquarters to get anything from the stock room. I went to the general manager and he told me to make out an order on a blank and he would send it on to the managing committee. After they O. K. it and the president and a few more put their initials on it, it comes back to the general manager, who turns it over to me, and if I haven't gone out and bought a pencil by that time, I can get one by presenting the ticket to the stock keeper. But I want that pencil this morning and I can't get it until afternoon or to-morrow."

"Here, I'll give you a pencil," said the tester, as he drew a greasy stub from his overalls' pocket.

"O, don't try to be funny—it's no joke," was the pettish reply. "I suppose I could take your pencil, but have I got to run out here and get a dirty looking article like that every time I want a new pencil? I'll tell you right now there's too much system here; the whole place is wrapped up in it."

"You can't run a business without system, can you?" queried the tester.

"No," was the retort, "but they ought to pay more attention to business and less to system. Who ever heard of big officers in a factory like this wasting their time over a pencil that doesn't cost over a cent. And look at me: I've lost my head and will have wasted an hour, and that is worth—let's see, nearly two dollars and a half. I know, of course, system is all right, but it is like booze and some other vices; it ought to be used with moderation.

"It's not only this particular instance of the pencil, but you find it everywhere. How many times has it almost lost a sale? More than once I have had a $5.000 car standing on the final assembly floor waiting for some little part, like a windshield or horn, while the part intended for the car and drawn out of stock for it had to go back to the factory because there was some slight defect in it, and the car had to wait for perhaps two weeks, while the owner was yelling like a wild man and wondering why we didn't send his car on schedule, as we agreed. I have spent hours smoothing out these complaints.

"Then, at the same time this car was being held up, there were cars further down in the line, with identically the same parts on them, and a shift could have been made and the first car gotten out of the way, and if the defective part hadn't returned by the time this next car reached the head of the line, another shift could have been made and things kept moving; the factory wouldn't have any great trouble keeping track of things, and it certainly would have given satisfaction. Once, we had an owner who had bought our cars for several years, and various things had not caused him to be in the happiest frame of mind, and when there was a prospect of his car being held up for a week or so I was sure he would cancel the order if he didn't get it, for he had written me he wanted to start on a tour on a certain date with a party of friends, all of whom had cars. I persuaded the foreman to make a shift and get the car out on time—but never again! We saved the sale, but I almost lost my job and the foreman was given to understand from whom he was to expect orders in the future. And that person who is to give him orders isn't the sales manager.

"Lots of times a whole line of cars which are coming through from a certain lot of stock are held up because some of the parts are not finished. The system works fine, because it keeps the lot together and it leaves the factory at the same time. But what I never have been able to discover is why the system isn't placed to work on the other end and followed up, so that the work will go along as it should and these parts be ready when the cars get to the final assembly floor. It's like a political campaign that is run with vim in spots and a big vote is piled up with good results, but the falling down is so emphatic elsewhere that the total result is disappointing.

"I don't know which is worse—a factory that is all system or one that never had a system. We won't mention any names, but I know one factory where the proper running of things is put up to certain men. No one asks how they do it, but they are expected to see that things come through on time and correctly; of course, these men must have some system of their own, but as long as it works no one tries to tell them about some other. There are times when things go wrong, as they undoubtedly will without a good general system, but good, efficient men, to my mind, are worth more than books full of system.

"Now, our system, so far as the system goes, is all right as a general rule, but too much is centralized. The stock keeper is getting fair wages and is an honest, capable man; so why couldn't he take care of his stock. He knows how many pencils every man is entitled to, and if any one began to go too heavy on the supplies the stock keeper could investigate; or what would be the matter with the head of every department approving the orders for supplies in his domain and let it go at that? Instead, here is the general manager, getting $10,000 a year, wasting his time O. K.ing orders for penny pencils. If a man is competent to manage a department, why isn't he competent to order what supplies he needs? If the boys up front want to economize there is no one who more gladly would jump in than we and fight to keep down expenses; but instead of that the high-salaried men are worrying over too many little things, when they have subordinates who are paid for doing just that thing.

"I don't mean to say that system is wrong. I believe in it with my whole heart, but I do also perform a little worship now and then for the God of Common Sense, and he's a pretty good old pal to have in business with you."

"I dare say you're right," rejoined the tester. "Of course, we don't stack up against the system like you do, but I've heard all kinds of arguments on the proposition. All we have to do is take care of the testing end, although we get a little system now and then, I always try to keep things running right. On the other hand, this company pays me pretty good money to do good work, and I think it's up to me to do it as they want it done, and if they tell me they would like to have the cars tested out backwards on the road and the motors run on three cylinders in the test shed, I think it's up to me to do it. Besides, there may be reasons for a lot of peculiar orders such as those, and there

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are a few things about the inside of the business that I don't happen to know."

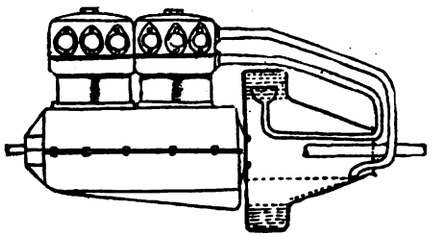
"That's common sense, too," said the sales manager, as if the tester's view of things might not be so bad in the sales department. "Anyway, thanks for those drops of water—and maybe I can get along with the system. I surely ought to be able to do so, if the rest can. Also, as you say, I'm not running this business. I'm holding down a job."

As the sales manager started back for the office the tester called, "Here, don't you want this pencil?"

"No," was the answer, "I guess I didn't need it as bad as I thought I did. A wait won't hurt."

Using Flywheel for Cooling Purposes.

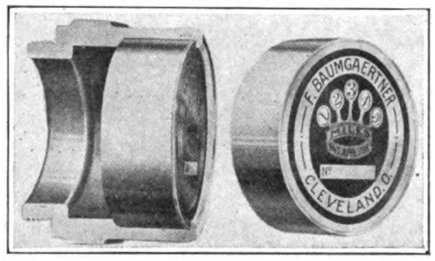
According to the views of C. Constantini, a Roumanian engineer who recently perfected and placed on the English market a carburetter which it is claimed is efficient when using either kerosene or distillate, the proper location for the radiator of a motor is in the fly wheel. His idea of how it may be done is expressed in a patent cov-



ering the arrangement shown by the accompanying picture. The flywheel of the motor is cast hollow with a tapering projection on the front. Into the funnel attachment pass the leads to and from the jacket, the former having a flared end which serves to collect the water which distributes itself around the hollow channel of the flywheel when the latter is in motion. On the return, the water is allowed to trickle down the inclined sides of the tapering projection, whereby, it is said, it is sufficiently exposed to the cooling effects of the air to be reduced to the proper temperature for return to the jacket.

Gravity Odometer That Comes from Ohio.

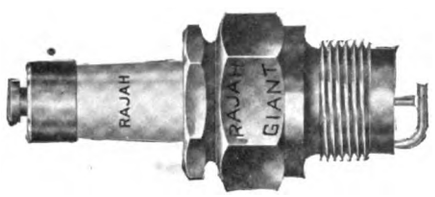
To check the performance of any commercial vehicle, it is absolutely essential that an accurate record of mileage be kept, for it is on this factor that all computations affecting efficiency, depreciation, cost of operation and general all around ability must be based. Obviously, it is not sufficient that the mileage be known to within three or four miles, nor it is permissable, for accurate results, to attempt to figure actual car mileage from road maps even when the route of the vehicle is laid down and adhered to as closely as possible. It is not possible for any vehicle to continue for any great length of time in a perfectly straight line, and it is the deviations necessitated by poor spots in the roads, obstructions such as horsed vehicles, for which the truck must turn out, and the inevitable detours which frequently become necessary by reasons of road construction, that make up the discrepancy in mileage which may affect efficiency figures to an extent that is unsuspected. It was to eliminate the necessity for all computations to determine actual vehicle mileage and to provide a means whereby accurate record of the number of miles covered might be preserved from day to day that the Coronet hub mile recorder for trucks was developed. It is the



product of E. Baumgaertner, of 2344 East 105th street, Cleveland, O. As may be seen by the accompanying picture, the device is small and compact and is designed to be attached in place of the standard hub cap. In fact, it is pointed out, its appearance is such as scarcely to warrant detection of its presence; it is made to resemble any hub cap, and when in place projects not more than five-eighths of an inch further than the hub cap which it replaces. In construction it is similar to several other devices of the same general nature which are on the market and operates solely by gravity, there being no connection whatever between its mechanism and the axle of the vehicle. It is guaranteed for a period of two years.

Rajah Produces Spark Plug for Trucks.

That a chain is no stronger than its weakest link is an axiom which is time hon-

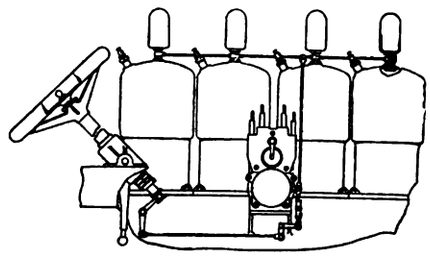


ored. The weakest link in the commercial vehicle, according to the Rajah Auto-Supply Co., of Bloomfield, N. J., is the spark plug, which often is not equal to the task imposed upon it when in service on a commercial car, although perfectly capable of giving a good account of itself in the less strenuous pleasure car service.

With this in mind the Rajah Giant plug, shown in the accompanying picture, and which has been designed expressly for use where excessive vibration and general rough handling are common. The name Giant relates more to the characteristic sturdiness of the product than to the size, for the measurements of the latest Rajah plug are but very little greater than those of the regular product. Not including the clip terminal, which is an "added feature," but four parts enter into the construction of the plug, a steel shell carefully threaded with S. A. E. standard threads, a brass bushing, copper asbestos gasket, and a special imported porcelain. All parts save the porcelain and wire electrodes are made in the Rajah factory on special Brown & Sharp machines, which insures accuracy and interchangeability of the parts, which, coupled with the fact that so few parts are used, makes the removal of the core for cleaning or adjustment a simple matter.

Starter That Operates from Steering Post.

Working on the theory that if one has to perform a "contortion act" in order to reach a pump handle and inject a charge of explosive mixture into the cylinders, then give another twist to press the button which controls the ignition of the charge, not much comfort can be obtained from the application of a starter of the ignition type,



Unterberg & Helmle, the widely-known magneto manufacturers, whose factory is located in Hamburg, Germany, have developed an ignition starter designed to eliminate manual labor in so far as the pump is concerned; the only movement necessary for the starting operation is the turning of a small lever positioned with the spark and gas levers on the steering column.

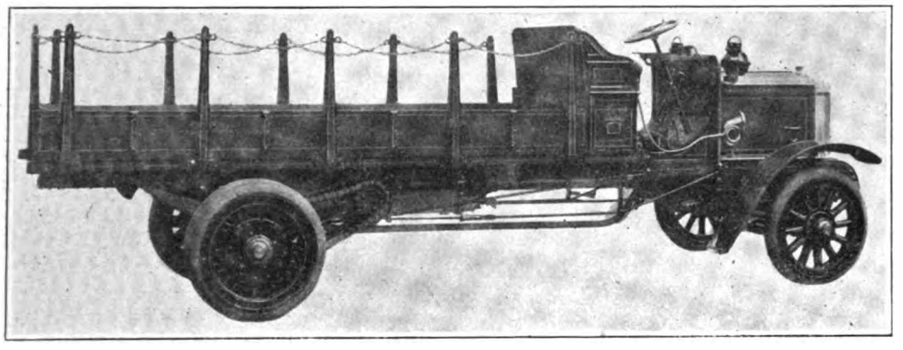
The device, which is shown by the picture, consists of four pressed steel chambers which are positioned one over each cylinder of the motor and are connected therewith by means of a passage. Stopcocks which are provided in the passages are linked together so they can be controlled in unison by the proper manipulation of a lever which is placed on the steering post. The movement of the lever also is communicated to the armature of the magneto, so that the use of a coil for starting is unnecessary. After the motor is switched off, the stopcocks are opened and a supply of gasolene and air in suitable proportions is forced into each of the chambers and retained by means of checkvalves. The cocks are closed when the fly wheel has come to rest, so that the mixture is retained under pressure. A movement of the starting lever at once opens communication with the cylinders and produces a spark in the cylinder which is on the firing stroke.

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DRIGGS-SEABURY ADOPTS VULCAN

Chooses that Name in Formally Entering Truck Trade on its Own Account—Its Line Varied and Complete.

Although the Driggs-Seabury Ordnance Corporation of Sharon, Pa., has for a number of years produced commercial vehicles for others, among them the American Commer truck, and has been and still is engaged in the manufacture of frames and sundry other parts which go to make up trucks, it at last has commenced the manufacture of a line of trucks of its own which will be marketed under the name "Vulcan." Whether they will be marketed through agencies has not been definitely decided. In the meantime the company is holding the reins in its own hands. The trucks themselves are of standard construction throughout and reveal nothing that is radical or startling, the sizes at present ready for the market including vehicles of 3, 4, 4½, 5 and 7 tons capacity. Eventually, the line will be further rounded out by the addition of 1, 2, 6 and 8 ton sizes, these being at present on the draughting tables and in process of building.



SIDE VIEW OF 4-TON VULCAN TRUCK WITH STAKE BODY

All of the variously rated vehicles are of the same general pattern, the engine being located under a hood at the front, behind the radiator, thus centering 70 per cent. of the weight of the vehicle and its load over the rear axle and ensuring positive traction at trying moments, as on bad roads or when the pavement is wet. In all the trucks but two sizes of motor will be used. The motors themselves are the product of the Driggs-Seabury company, and inasmuch as they are identical except for a difference of ⅜ of an inch in the bore a description of one will suffice for both. The smaller motor, which will be used in all the vehicles rating up to five tons capacity, is of the four-cylinder vertical four-cycle type with the cylinders cast in pairs and the valves all located on the same side. The cylinder dimensions are 4⅜ inches bore and 5½ inches stroke, the S. A. E. rating therefore being 30 horsepower. The larger motor, which is used in all the other vehicles, differs from the other only in that the bore measures 4¾ inches, the rated horsepower, according to the S. A. E. formula, being 36.

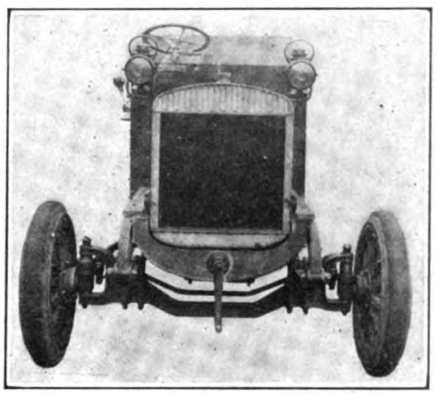
In the case of the 1, 2, 7 and 8 ton vehicles cooling is effected by pump circulated water, thermo-siphonic action being relied upon in all the others. All have Bosch dual ignition supplemented by a coil and 6-volt storage battery and a combination automatic level pump-over splash lubrication system in which the oil is maintained constantly in circulation. In order to eliminate the possibility of accidental damage to the motors through frame weaving they are supported at three points in the chassis frame.

All the motors are regularly equipped with centrifugal speed governors which are set to restrict the speed of the vehicles up to three tons capacity to 18 miles an hour. The other speeds are as follows: 8-ton, 10 miles an hour; 7-ton, 12 miles an hour; 6-ton, 14 miles an hour; 4- and 4½-ton, 16 the engine to the road wheels through the miles an hour.

Power in each case is transmitted from intermediary of a leather-faced cone clutch. selectively operated change gear mechanism locatd in the waist of the chassis and heavy side chains. In all the trucks up to four tons capacity the change speed mechanism is of the sliding gear type, while in the others the gears are constantly in mesh and are engaged by means of sliding dogs; the 6-, 7- and 8-ton trucks have four forward speeds and reverse, and all the others have three forward speeds. The side chains are not enclosed in chain cases. Two sets of brakes are provided on all the chassis, the service set being located on the jackshaft and the emergency set on the rear wheels. The differential is integral with the change gear mechanism, and on the three largest vehicles in the line is equipped with a differential lock.

The wheelbase of the 1-, 2- and 3-ton models is 144 inches and provides a loading space behind the driver's seat of 123 inches. In the vehicles of from 4 to 6 tons capacity the wheelbase is 162 inches, providing an available loading space of 144 inches and a loading space of 146¾ inches. Springs in each case are semi-elliptic both front and rear and are properly proportioned to the load. By way of providing ample tire capacity and to facilitate repairs and replacement, all rear tires are of the dual type and wheels, both front and rear, are fitted with standard S. A. E. detachable rims. In all but the 7- and 8-ton vehicles the tires sizes are the same front and rear, the vehicles up to 3 tons capacity being fitted with 36 x 4 tires; 4-ton, 36 x 5; 4½- to 6-ton, 36 x 5½. On the 7- and 8-ton trucks the front tires measure 36 x 6 and the rear tires 42 x 6 inches. The wheel track in each case is standard—66 inches.

In common with the majority of the other parts that make the trucks, the steering gear is produced by the Driggs-Seabury company, and in each case it located at the right side with the control levers at the driver's right hand. The list prices of the five chassis that now are ready for distribution are as follows: 1-, 2- and 3-ton, $3,600; 4-ton, $4,000; 4½-ton, $4,500; 5-ton, $4,750; 7-ton, $5,600.



VULCAN FRONT AXLE CONSTRUCTION

Why Speedometer Dial Hands Oscillate.

It is one of the peculiarities of many types of speedometers that directly the car is driven over rough roads the dial hand oscillates more or less wildly back and forth and makes reading the meter practically impossible. The trouble becomes most pronounced when the car is driven at speed, and this fact in itself should suggest the cause of the inaccuracy which seldom can be traced to imperfection of the mechanism of the instrument. Instead, it is caused by the front wheel bouncing over obstructions in the road. When a car is driven at high speed and one of the front wheels passes over an obstruction with sufficient abruptness to cause the wheel to jump off the road, its rotative speed momentarily is increased and this, in turn, causes a corresponding movement of the dial hand of the meter. Plainly, there is no remedy for the trouble other than shifting the speedometer drive from the wheel to some other portion of the car, as the propeller shaft or one of the change gear shafts, for instance. In some cases, where a car is not fitted with shock absorbers, the addition of these accessories may effect a cure and, in any case, should alleviate the trouble to a certain extent.

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TRUCK DOES WORK OF 20 HORSES

Six-Ton Vehicle and Two Tractors Equal Ten Teams at Half the Cost—Sioux City Road Work.

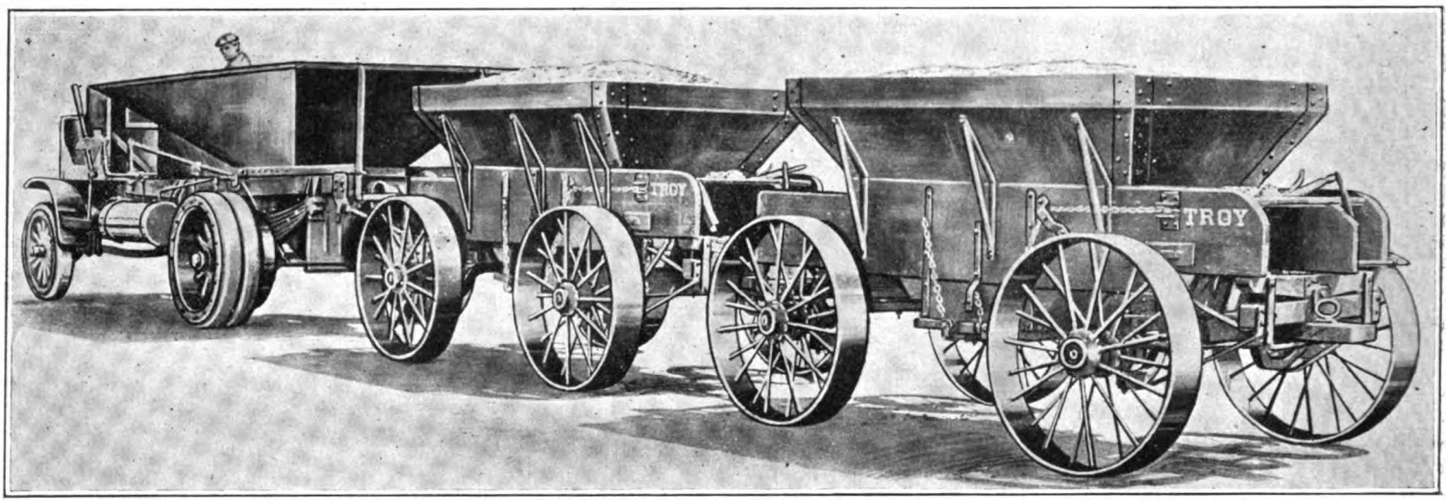
Though the idea involved in the use of one or more trailers drawn by one powerful motor vehicle, thus making of the unit a road train, has made a deep impression abroad, where "trains" consisting of even four heavily laden trailers drawn by an immense steam tractor are common enough sights, it is only comparatively recently that this form of transportation has been attempted or adopted to any extent in America. Gradually, however, the popularity of this method of freight handling is increasing, the increase being proportional as the economy and worth of the system becomes established.

The progress of a road train of this character necessarily is slow, for though the driver of the tractor has all the vehicles in tow under his control, greater circumspection in driving is necessary in order to avoid interference with other vehicles and also because of the weight of the train. It is an undisputed fact that there is a load capacity for any commercial vehicle which it is inadvisable or unsafe to exceed. That is to say, there is a well-defined limit to the actual weight which the vehicle may be expected to carry with economy and safety. But if a vehicle is loaded to its full capacity there still remains a certain surplus of power and tractive effort which, under ordinary conditions, advantageously may be utilized in other ways. Naturally, the simplest way and the way which suggests itself the first is to cause the vehicle to draw another behind it. and it is herein that the tractor and trailer scores, for it then is possible to transport nearly twice the weight with the same power and without the necessity for straining the mechanism of the power element, which need not necessarily carry more weight than that for which it is designed.

As an illuminating instance of the economy of this method of transportation, the record of a six-ton Knox truck and two trailers which has been made in service building roads in Sioux City, Ia., might be cited. The truck itself is a standard Knox product equipped with a special quick dumping body to facilitate the delivery of loads.

The two trailers have a combined capacity of six cubic yards of earth. During a busy season it has been possible with this equipment to transport over a 3½-mile radius 44½ cubic yards of material a day. By way of comparing this record with what might have been done with horses, it is pointed out by the contractor that to transport the same amount of material in the same time would have required not less than 10 two-horse teams, whose cost of upkeep would have been more than twice as much as the operating cost of the truck and trailers.

Nor was all the hauling done by the train on level roads. A goodly portion of it was in hilly country, where the grades varied from 3 to 7½ per cent. Naturally, such strenuous work puts a tremendous strain on the tractor, and consequently such methods and such loads are not sanctioned by manufacturers. Nevertheless, it serves to demonstrate just what may be expected in the way of service from a motor truck, provided the method of handling is efficient and the strains which are imposed on the mechanism are not such as to exceed the liberal factor of safety for which allowance always is made by the manufacturer.



KNOX 6-TON TRUCK AND TRAILERS WHICH HAVE A RECORD FOR EFFICIENCY

Drain Pipe that May Require Cleaning.

In washing cars, it is inevitable that a certain amount of oil and grease should be removed in the process and find its way down the drain pipes along with the waste water. It is to collect such accumulations, and stray pieces of cotton waste and sponge that a trap is placed in the pipes, and in order that the water may find ready escape it is advisable occasionally to remove the plug in the trap and thoroughly clean out the cavity. If the trap is not fitted with a plug and the accumulation of water gives evidence of an obstruction in the pipe line, permitting a strong solution of ordinary lye in hot water to run down the drain pipe may effect a cure.

Handling Cores Sand Will not Support.

A core that cannot be supported in the sand of a mould would seem to be a rather difficult thing to take care of; it is held in place, however, by the simple expedient of inserting iron wires in the core and extending them across the space to be filled with molten metal and into the sand of the mould. When the iron is poured it becomes welded to the wire, so that the supporting medium does not interfere with the soundness of the casting.

Aluminum Paint as Coating for Rims.

While beeswax and graphite have been recommended as a coating for rims which will permit the tire to slide quickly and easily into place, there are those who prefer a coat of aluminum paint to either. However, care should be taken to remove all rust with sandpaper or a wire brush, if necessary, before the application of the paint, for otherwise the paint will chip or flake and the result will be worse than if no paint had been applied. It is best to mix the paint thin and apply two or even three coats.

To Reduce Rain "Speckles" on Bodies.

The varnish on a new car, or a car newly painted, is liable to become "speckled" if it is rained on. Although these spots are not wholly eradicable, the application of a mixture of equal parts of raw linseed oil and malt vinegar and not a little of the always effective "elbow grease" will render the marks less noticeable.

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LIGHTING SYSTEM THAT DIFFERS

Blitzen Device Controls Gas at the Tank—Also Has Magnetic Valves and Practically no High-Tension Wiring.

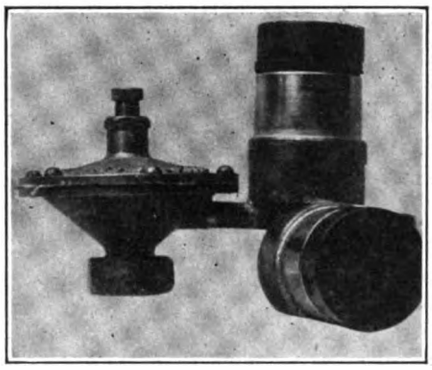
One of the difficulties of the existing type of systems which are designed to permit acetylene head lamps to be lighted from the driver's seat, and one which in the minds of not a few militates against their more universal adoption, is that it is necessary that there be a certain amount of gas pressure in the pipes leading from the tank to the dash apparatus. That is to say, after the gas is turned on at the tank its control devolves on a valve on the dash. Even when a pressure reducing valve is used to maintain the pressure in the pipes at but a few ounces, the fact remains that there is a certain amount of danger that leaks may develop owing to road and engine vibration.

It is to obviate the possibility of such leaks occurring by controlling the gas directly at the tank that the Blitzen Lighting System, manufactured in common with the Blitzen starter by the Henry Mfg. Co., of 141 West 55th street, New York City, has been developed. And so successful have exhaustive tests proven the devices to be, it is stated, that already one of the largest and most influential automobile manufacturers is experimenting with it, with a view to adopting it for use on its extensive line.

Obviously, the gas controlling valve is one of the most important parts, for upon it depends the action of the whole system. The other parts, however, are equally important and equally clever in design, the proof of the efficacy of the whole being substantiated in a demonstration by W. J. Foster, who has developed this and other electrical devices of a somewhat similar nature, notable among which are his "spark absorber" and his engine starting switch.

The principal difference between the Blitzen system and others of a similar nature is that, whereas electricity is relied upon to furnish only the spark which lights the lamps in the other systems, it is relied upon to do everything except furnish the light in the Blitzen system; in other words, the acetylene gas is turned on and off and lighted by electricity, the dash equipment merely consisting of two small buttons and a vibrator, the latter being located behind the dash or in some other convenient place. The valve which controls the flow of gas to the burners is operated by solenoids and is positive in action, has remarkably few working parts and is almost as light as the proverbial feather. As may be seen by the accompanying illustrations, it is in the form of two small cylinders which are designed to be attached directly to the pressure reducing valve, which in turn is attached to the tank outlet.

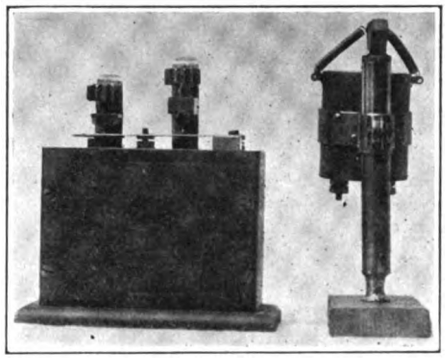
In operation, pressure on the white dash button—the black one serves to extinguish the lights—causes current from the battery to flow through one of the solenoids, raising its core and opening the gas valve to the burners. The valve is held open by an extension pin on the core of the second solenoid which, spring impelled, slips under the end of a similar pin on the core of the first solenoid. At the same time, a spark



BLITZEN MAGNETIC VALVE

is generated and ignites the gas at the burners. To extinguish the lamps merely requires that the black button be pressed when the pin on the second solenoid, which holds the valve open, is withdrawn and the core of the first solenoid returns to its normal position under the influence of a spring and closes the gas valve. The operation of the whole is instantaneous, of course, and the lamps may be lighted and extinguished almost as fast as it is possible to press the buttons alternately.

Another of the interesting features of the



BURNER COIL AND VIBRATOR

system lies in the use of miniature induction coils which are mounted directly on the burner, as shown in the illustration. The reason for the use of these tiny coils, it is pointed out, is to obviate the necessity for stringing lengthy high tension current wires from the dash to the lamps. As high tension current is exceptionally prone to escape, particularly in wet weather when the lamp lighter might be expected to be in greatest demand, it is hoped by this means effectually to remove one of the principal sources of annoyance to which such systems as a rule fall heir. The only wiring in the whole system which carries high tension current are the two wires leading from the tiny spark coils to the burners; their length may be judged from the picture. Despite the small size of the spark coils, however, they are capable of generating sparks one-quarter of an inch in length, whereas a spark one sixty-fourth of an inch in length is plenty long enough to ignite the gas. The vibrator, which is designed to occupy an inconspicuous place on the dash, is of orthodox pattern, except that a novel means of trembler adjustment is used. It is virtually a spring working on a spring, for which reason, it is claimed, unusually fine adjustment can be made and the consumption of current reduced to the minimum.

What Causes Tires to Lose Air.

Of the tires tested by the Michelin Tire Co. on cars which stop at its factory in Milltown, N. J., a full 50 per cent. are found to be under-inflated, while of the tires received for repairs nearly 60 per cent. are found to have suffered from this cause. There are many ways aside from punctures and blow-outs in which the air pressure in a tire can sink below normal, says the Michelin company in commenting on the fact. The valve may not be airtight, or if the tire is new it may expand slightly when first used, with a conesquent reduction in pressure. Moreover, rubber, while practically airtight, is not entirely so, and the air will gradually filter through into the atmosphere. Air is composed chiefly of oxygen and nitrogen. The coefficient of diffusion of oxygen through rubber is higher than that of nitrogen, and in consequence the pressure in a recently inflated tire decreases in proportion to the diffusion of the oxygen. When the tire is reinflated the proportion of nitrogen within the tire, of course, becomes larger. So long as the original air remains in the tire this proportion continues to increase with every inflation, and thus the loss of diffusion becomes gradually smaller. The temperature of the outer air is responsible only for the very slightest changes in the interior air pressure of a tire. These changes are so slight as to be negligible.

Over-inflation likewise is injurious—not to the tire so much as to the car. An over-inflated tire has little or no resiliency and thus transmits shocks to the chassis, which under incessant jarring is bound to suffer. It is obviously necessary, therefore, to keep the tires pumped up to just the right pressure. The only way to accomplish this is frequently to use a pressure tester.

Damage That a Packing May Do.

Although the idea of providing a stuffing gland at the top of the valve guide to prevent the loss of oil from around the tappet is good, care should be exercised to keep the packing from interfering with the free operation of the tappet, else a sluggish motor will result.

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NAVALATUM NEW FORM ALUMINUM

Metal Specially Treated by British Formula Has Remarkable Properties — Anti-Friction Material, Strong and Light.

When, almost 30 years ago, aluminum ceased to be a metallurgical curiosity and its employment for practical purposes was commenced, great hopes were entertained for its ultimate use for a variety of purposes which up to that time had required heavier metals or wood construction. Unfortunately, however, the light weight of the then new metal was almost its only really valuable property. As is fairly well known, it could be cast and otherwise worked in a number of ways and soon became fairly useful. But castings were brittle and under the influence of the elements soon deteriorated and became practically worthless. Even promising alloys of the day failed after one or two years and it was not until comparatively recently that really satisfactory alloys were produced. At present such alloys are used with entire success.

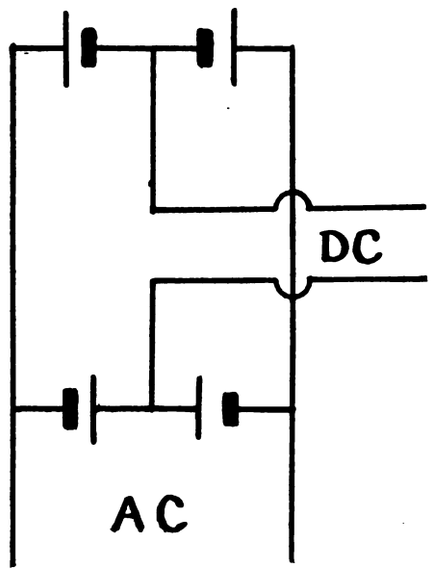
The study of the metal always has been an absorbing one for metallurgists, however, and the discoveries that have been made and the new alloys which constantly are appearing, each has some particular virtue which makes it applicable to some particular purpose. Few alloys have the desirable property which will permit their use for all purposes, though within the past few weeks a new alloy has been developed abroad for which great claims are made. The new alloy is styled Navalatum, and though it is not as yet on the market, it soon will be exploited by a British company bearing the same name and having headquarters at Worcester House, Walbrook, E. C., England.

Strictly speaking, the new product is not an alloy as the word usually is understood. Instead, it is pure aluminum treated with a flux after the manner that Bessemer has made famous in his process for the conversion of iron into steel. While its texture, structure and physical properties are changed in the process, its lightness is not impaired; it is said that in some cases the specific gravity even falls slightly. In castings, it is said by the manufacturers, Navalatum has a greater strength than the best gun metal combined with the ductility of malleable iron; furthermore, in its drawn or rolled condition, it is possessed of strength very nearly equal to that of mild steel and has the annealing properties of copper. Among the other broad claims made for the new product are that it is not corroded by salt water or dilute acids and that it does not tarnish in the atmosphere.

Navalatum is said to cast the same as ordinary aluminum, brass or gun metal, no special furnace or other apparatus being necessary, and the castings having perfectly clean edges in the fine lines of the moulds. The breaking strain is from 32,000 pounds upward and the specific gracity is 2.6. Another of the peculiar properties of the metal is that it can be drawn cold either as bars, angles, tubes or wire, as readily as brass or copper, without the necessity for special apparatus, and can be annealed in exactly the same manner. Furthermore, it can be soldered and welded, and by reason of the fact that screws and rivets may be made of it, and two parts of the same material thus fastened together without the necessity for the use of any other metal, electrolytic action may be positively eliminated. As a last and clinching argument in favor of the new product, it is said to be an excellent anti-friction metal.

To Increase Efficiency of Rectifiers.

Probably the chief reason why the chemical rectifier is not in more common use for charging storage batteries where alternating current only is obtainable, is the



very low efficiency of the apparatus when connected in the ordinary manner. Theoretically the best that can be obtained from this type of rectifier when connected in series with the battery is about 50 per cent., as the aluminum cells act as a "check valve" and prevent the return of one impulse which consequently is lost. If, however, the cells are connected as shown in the accompanying diagram, the efficiency is considerably increased and the only losses are those which result from the resistance of the electrolyte and which are dissipated as heat.

Why New Fans Should be Watched.

The blades of some fans have an objectionable habit of working loose on account of defective riveting at the hubs, and for this reason a new fan should be rather carefully watched for a time. A loose blade can do a good deal of damage, and when one blade goes the rest of the fan often is damaged, if running at very high speed, because of the lack of balance.

FARRIERS STILL FIND MANY HOOFS

Business so Good Horseshoers Consider a Raise in Rate Advisable—Trade Authority Tells the Reason.

Despite the fact that the motor driven vehicle has made inroads upon the domain of the horse, its inroads have not greatly disconcerted the horseshoers, at any rate, according to J. C. Buckley, of Detroit, editor of the Horseshoer's Journal. Buckley says business is as good as ever, so good, in fact, that because of the increased cost of supplies the Detroit master horseshoers consider it advisable to raise their rates, and so far as the number of horses in use is concerned, Detroit is not greatly different from the average growing American city.

"The growing trend toward motor trucks," said Mr. Buckley, "and the increased use of automobiles has positively not hurt the horseshoers, no matter what one may think. In fact, the master horseshoers, after a careful canvass, have decided that business is as good, if not better, that at any time the oldest horseshoer can recall.

"They admit that in the shoeing of carriage and driving horses a marked reduction of work is seen. Indeed, the volume of light driving or carriage horseshoeing that is done is of comparatively little consequence.

"But the great growth in the city's population has more than made up for this loss of the light work by the great increase seen in the number of delivery and draft horses on which horseshoers are kept busy. The only complaint heard among the followers of the trade is toward the reduced profits in the business. The heavier grade of work to be done calls for more expense in buying supplies than formerly, and besides, the cost of all supplies has increased.

"So, too, have wages of workingmen increased, and with the cost of living almost prohibitive it has been decided by the horseshoers to ask an increased price for shoeing. The horseshoers in other cities are paid from 25 to 50 per cent. more than Detroit shoers are now getting, they say."

Provides an Arm Rest in Rear Seat.

By way of increasing the comfort of passengers who occupy tonneau seats, the manufacturers of Argyle cars, which are made in Scotland, recently have developed a clever device in the form of a removable arm rest for attachment in the center of the seat. It is pointed out that the comfort of motorists may be greatly increased, providing a rest for both arms is available, and it is hoped that the new device will have the desired effect. Of course, it cannot be used when the rear seat is occupied by more than two persons, for which reason it is so constructed as to be readily removable and may be stored beneath the seats.

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GOOD SERVICE SECURED FROM DOUBTFUL EQUIPMENT

How One of the Large Express Companies Converted Battery-Driven and Even Horse-Drawn Vehicles Into "Batteryless" Trucks—Lessons That Were Learned by the Change and the Manner in which the Reconstruction Affected the Efficiency of the Service.

It not infrequently happens that battery driven trucks are put to service that is too severe or too extended for the capacity of the batteries, the result being that the supply of current becomes exhausted before the day's work is completed, with no means of either charging batteries or obtaining a "boost." While troubles such as these are far more infrequent than was the case a few years ago, due not only to the greatly increased number of charging stations that are available for boosting purposes, but also to the superiority of the present-day battery over its predecessors, there still are not a few electrics engaged in commercial work that do not quite come up to the mark because of some drawback that is more or less directly traceable to the unavoidable limitation of the current supply when on the road.

Another difficulty that sometimes occurs in connection with electric commercial vehicles is that through improper handling the batteries become worn out or so seriously damaged as to be practically useless, leaving the car in a state of enforced idleness until a new source of energy is installed. A new battery costs a good deal of money, however, and there are many instances where owners of such machines, having neither the facilities nor the men to care for batteries that are used in severe service, prefer to let the machines stand idle, or else sell them for a song, to purchasing new batteries with the expectation that they will shortly go the way of the first sets of cells. It perhaps is unnecessary to add that these are not imaginary combinations of circumstances, but that they actually exist to a considerable extent.

Individual owners of one or two vehicles usually "scrapped" their machines or sold them for what they would bring and placed the unrecoverable cash in the every ready profit and loss column. The big concerns are even more averse to that proceeding than are the "little fellows," however, and at least one, the United States Express Co., made a determined effort to make use of the old equipment by the ingenious expedient of discarding the batteries altogether and installing in their stead, and in their place in the cars, generating plants, each consisting of a small gasolene motor direct connected to a direct current generator, the capacity of the outfit being sufficient for all the ordinary requirements of the work done by the vehicles. The trucks that required rejuvenating at the nerve-centers, so to speak, were of various sorts and sizes, and at least one was an impossibility as a battery-driven machine, because its great weight, its comparatively small carrying capacity and its notable extravagance in the matter of current consumption precluded its use in any ordinary work, though, on the other hand, it was strong and eminently reliable while it was working.

The experiments that were made began with the installation of an engine and generator directly on the battery bed; the old controller was used and the current from the generator was carried to it just as was the current from the battery, and thence went to the motor or motors, as the case might be. Later more elaborate and more powerful installations were made. In running these converted machines several facts were impressed upon the experimenters—facts that, though quite familiar to users of machines of the gas-electric type, were rather novel to both battery men and gasolene men. In the first place, it was very noticeable that the machines could be driven at a much higher speed on level roads with the gasolene generating plants than with the batteries; this is accounted for by the fact that it was possible to run the voltage up to a point far above that of the batteries, and as the speed of a motor depends upon the voltage, it was not surprising that the cars sped along the levels at speeds that were quite remarkable. Incidentally, it speaks well for the motor construction in general and for the insulation in particular that, while they all were built for voltage not to exceed 90, they withstood without indications of weakness pressures up to 150 and even 175 volts.

Another fact, considerably less gratifying, was that when it came to applying maximum power for a short, slow pull the generating plant was found inferior to the battery—that is, the battery was capable of delivering a tremendous amperage for a very short time, while the generating plant was limited, of course, by the maximum horsepower of the engine. This was a matter of comparatively small moment, however, for though the engines first used were too small for use under unfavorable conditions, the use of a little more horsepower afforded a satisfactory remedy, though it may be said that the installation of an engine capable of developing a maximum output equal to the maximum output of a battery suitable for the same car would involve sizes and weights of unjustifiable magnitude, and really was unnecessary.

The first installations of gasolene-electric generating plants as substitutes for batteries were made with two-cylinder opposed engines, air-cooled, of high speed because it was considered necessary to use a high-speed generator in order to keep the weight within reasonable limits. Incidentally, there was a saving in weight over the battery installation of approximately a thousand pounds. Unfortunately, the first engines selected were faulty in that they failed to deliver their rated horsepower, they failed to cool when worked hard, and they failed to lubricate adequately; in other words, they came near to being thorough failures. They served their purpose, however, in that they demonstrated the feasibility of the principle involved, and as a result larger motors—water cooled, however—were employed.

By special designing it was found possible to have built generators that, while light in weight and small in size, were capable of delivering heavy currents and withstanding high overloads for short periods, but which, nevertheless, ran at very moderate speeds. For instance, the smallest generator delivered its normal output, 28 amperes at 90 volts, at 600 R.P.M., and had an overload capacity of 200 per cent. for ten or fifteen minutes. Its weight was 279 pounds. A larger size, weighing 450 pounds, delivered its normal current of 84 amperes at 90 volts at 575 R.P.M. and had the same overload capacity. This low speed made it unnecessary to use fast-running motors, and also had the advantage that sufficient current to start the car was generated without the necessity for speeding the engine up to a high rate.

The first motors used, rated at 15-18 horsepower, never would do much better than 10 horsepower; nevertheless, they handled loads of from one to nearly three tons. Naturally, the heavier loads could not be carried up very steep grades or be properly taken care of under difficult conditions; but loads of one ton and less were handled with surprising facility, even on fairly steep hills, and though the maximum available power was very considerably less than with a battery, the average time made was much better. This is accounted for by the fact that the speed on the level was better than the speed possible with battery current and more than made up for the time lost on the hills.

In most of the vehicles experimented with there were two driving electric motors, and this greatly facilitated control, for the connections made through the controller

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permitted the motors to work in series for heavy pulling and in series-parallel for speed. In the first machines, with low-powered engines, the series grouping was considerably in demand, just as is the low gear of a gasolene car with a small motor. When the power was increased, however, the series notch was used only under severe conditions, and practically all running was done on series-parallel.

The cars handled with a flexibility comparable to that of a steam car. With the engine running at its lowest practicable speed it turned over the generator so slowly that only a feeble current was generated—nothing like enough to move the car. As the R.P.M. rate increased, however, the current output increased proportionately. Therefore the driver, in starting the car, would first see that his controller was in the off position and then start his engine. Mounting to his seat, he would swing his controller handle to the series-parallel or full speed position, which, of course, would have no effect so far as starting the car was concerned, because of the feebleness of the current. By opening the throttle and advancing the spark. the engine was speeded up and the car started on the rising voltage with a smoothness that could not be exceeded.

If the engine was speeded up suddenly there was a slight lag in the response of the car to the impulse—or, rather, there was a cushioning effect, so that there were no shocks or jars. Of course, any speed could be held indefinitely, merely by regulating the engine speed, so that the handling of the machine was much like the handling of a "steamer." This smoothness of operation was found to be a considerable advantage with the class of drivers that the express companies find it necessary to employ. It was possible to start the machine with a sudden jump by first speeding up the engine and then throwing on the controller; but it was a little easier to handle the car in the proper way, and therefore there was very little trouble from this source except in an occasional case of forgetfulness on the part of a green driver.

As the experiments progressed, larger installations were made, and with these it was found advisable to mount the engine and generator on a separate frame which was hung under the car in the place formerly occupied by the battery. The power plant thus formed a unit, and its attachment was a comparatively simple matter, especially as it involved no extra bracing or strengthening of the car—in fact, in all cases there was a very great saving in weight over battery installations, and this was taken advantage of by increasing the normal load rating to the extent of the saving in dead weight.

The encouraging results obtained from the substitution of generating plants for batteries led to experiments in the conversion of horse wagons into automobiles by a somewhat similar process. One of the experiments consisted of replacing the front wheels of a standard "double" express wagon—that is, a two-horse wagon—with a pair of couple-gear wheels, in which the electric motors are enclosed in the steel disks which take the place of wheel spokes, and drive through gearing. Nominally the wagon carried one ton; actually it carried three and one-half tons on at least one occasion—and, in the vernacular, it got away with it. The power installation consisted at first of one of the air-cooled engines already referred to; and though several months' fairly satisfactory work was done with this outfit, the engine finally went to pieces by the broken connecting-rod route, and was replaced by a more substantial machine of the water-cooled type.

As no provision had been made in the first place for a radiator, the dashboard of the wagon was cut away and a radiator attached by means of iron clamps and bands. There was absolutely no way of running a belt or shaft for a fan, but the problem of drawing air through the radiator was solved by the ingenious expedient of mounting an ordinary office fan, with its running direction reversed, directly behind the radiator, and connecting it with the main circuit. Beyond a little oiling occasionally, the fan got no attention, and it needed none. As soon as the generator started to generate current the fan would commence to buzz, and the harder the machine worked the more air the fan handled. Thus it was largely an automatic arrangement, and though intended only as a makeshift, it never gave any trouble and always cooled adequately. The controller used was of the ordinary battery car type. As, however, the car had but two speeds, or, rather, two running positions of the controller, the other three notches of the five-speed controller were connected up to graduated resistance, so that the car could be started with the engine running at full speed and delivering full current, the effect being practically the same as when starting with battery current.

In all these gas-electric machines, whether converted horse wagons or "batteryless" electric cars, so to speak, there were field resistances installed. The field resistance consisted merely of a rheostat in the field circuit of the generator. By cutting resistance into the field circuit, the flow of current through the field coils was more or less choked and the fields thus weakened, so that they exerted less "pull" on the armature and relieved the strain. The result of cutting in resistance is the immediate dropping of the voltage and the speeding up of the engine, so that by the time the generator resistance reaches the former point the speed of the engine is considerably higher. In other words, the generator does the same work at a higher speed, and thus with more driving power from the engine. The whole effect is that of a low gear with, however, a very large number of steps.

Large machines carrying up to five tons were found to work just as well with the generating plants as did the small cars. and notwithstanding the double change in the form of energy—that is, from mechanical to electrical and back again from electrical to mechanical—the gasolene consumption was sufficiently low to make the operation of the cars less expensive than with batteries. Engines of up to 40 horsepower were installed, with generators of suitable capacity, and in some cases two-cycle motors were used with good results. Because of the lack of vertical space, all the motors used were of the horizontal type, and no trouble was experienced due to this form of construction. It was found an easy matter to train ordinarily intelligent horse drivers to handle the machines, because of the simplicity of the control system, and it was rather difficult for even a clumsy and careless driver to do much harm before his negligence was discovered.

Says Paint Does Not Affect Radiators.

Although it generally is supposed that painting a radiator has a material effect on the efficiency of the device, experiments conducted by Prof. C. L. Norton, of Boston, would tend to prove that, provided the character of the surfaces are the same, a painted radiator is, to all intents and purposes, just as efficient as one which has not been so treated. If, however, the surface is roughened after the painting operations, the efficiency of the radiator is materially increased, for the rough surface dispels the heat more readily than a glossy surface.

To Remove Tar Spots from Bodies.

It seldom is possible to pilot a machine over newly tarred roads without transferring at least a few splotches of the sticky composition to the body. If treated in time, the spots are not difficult of removal. The machine should be washed to eliminate all grit, and dried by patting with the chamois so that the tar will not be smeared. Vaseline or butter next should be applied over each spot and worked in with the fingers. A thorough wash with body soap and a final polish in the usual manner completes the operation.

Rain Water as a Cure for Furring.

Probably no cure for "furring" of a radiator and connections is better than the simple use of rain water. Such water naturally has no minerals dissolved in it, and consequently will dissolve those which are present in the cooling system. The water should be drained off when hot, for it is then that it holds the greatest quantities of soluble salts in suspension.

Where Soft Tires Make Easier Going.

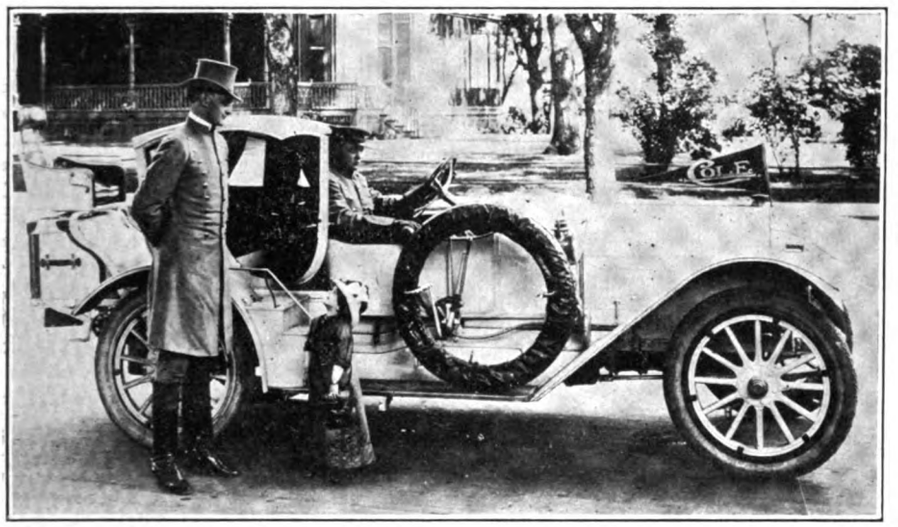
Sandy roads, in which the wheels sink deeply, may be more easily traversed, even by very heavy cars, merely by deflating the tires about one-half, so that they spread out and form a wider traction surface; this serves to counteract the sinking effect.

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LITTLEST COUPE FOR LITTLEST LADY

She's the "Miniature Melba" and Has a Cole Car Built to Fit—Requires Stairway to Enter Car.

While the commoner complaints as to the size of car bodies is that they are too small, there frequently being men who specify excess leg room and ample seating width, the Cole Motor Car Co., of Indianapolis, Ind., has encountered an extreme opposite demand and to meet it has produced what is probably the smallest coupe in actual use, at least, so far as the body is concerned. The customer, whose size was the basis of dimensions, is somewhat below the average height, although some women are almost lost anyway in the tonneaus of a few of the more luxurious models extant, but she apparently comes close to the record with 25½ inches from top to toe.



PRINCESS VICTORIA, HER GIANT FOOTMAN AND HER COLE COUPE

A stock roadster chassis of 1912 model was used, but the coupe part was of necessity entirely special in construction. The driver's seat was left intact, but the gasolene tank and trunk on the rumble deck were removed and the little enclosed body, almost a "cubby hole," was fixed in place, and, aside from dimensions, is fitted up just like an ordinary sized coupe; the upholstery is red satin. Since the diminutive owner would have some trouble making the step from the ground to the running board, there was constructed a toy folding yacht companionway, which, when not in use, folds under the running board, and to further assist the little lady in getting "upstairs" is a doll staircase on the running board.

Of course, since this arrangement is ideal for attracting attention, it fortunately happens that the little woman is an actress, known as Princess Victoria, "the miniature Melba," who is now touring the Canadian Northwest; and to further gain the publicity which is dear to the stage-worker's heart, the princess is the possessor of a footman, and he is some footman. He is a giant anyway, being seven feet tall, but when he stands by the opened door while the princess enters, the contrast in size is startling and his height is further accentuated when he mounts to a footman's seat attached at the back of the coupe body. The finish is in white enamel. Princess Victoria is 23 years old and weighs 193¼ pounds, and when the outfit was first seen by a friend he asked why she did not be more economical and have an extra large pocket made in the footman's coat and ride that way.

Dictaphones to Convict "Cutout Fiends."

That the dictaphone, which recently has become the one "best bet" on the witness stand, will be given its innings testifying against recreant motorists who are prone to use the muffler cutout in localities where such practice is looked upon with disfavor, seems evident from the case which was tried in an East Boston (Mass.) court last week. The defendants were owners of motor-equipped fishing boats who failed to muffle the motors sufficiently to make the exhaust inaudible at 2800 feet, at which distance the dictaphone made records which subsequently were heard by the Court, who, however, released the prisoners with a warning. It seems not at all unlikely that "noise traps" which will be in point of productiveness equal to the ever popular speed trap, will be established in localities where cutout ordinances are in force.

French Subsidy Trials Now in Progress.

The annual trials which the French government holds each summer to determine the fitness of competing vehicles for the use of the army in case of war, the manufacturers and owners of the vehicles that pass the tests being awarded a government subsidy, were inaugurated last week. No less than 68 trucks are taking part in the trials, which will last for several weeks.

ACETYLENE AS VIEWED IN ENGLAND

Laws that Make its Use in Compressed Form Illegal—British Engineer Explains Lack of Engine Starters.

Throwing interesting light on the engine starting problem as it is viewed in England, where, though devices of the kind have not as yet attained to anything like the popularity they enjoy on American soil, the problem nevertheless is spelled with a capital P and hedged about with much that is mysterious—to British intellectualities. C. A. Branston, who is a British engineer, in attempting to explain the lack of acetylene engine starters abroad, points out that as the law stands at present their use is illegal. Furthermore, in his opinion, the lawmakers have been perfectly right in thus placing a ban on the use of "compressed acetylene."

Woeful lack of experience can be the only excuse offered for a later statement, in which he says that "though the Home Secretary has the power to make an exception, it is sincerely to be hoped that he will do nothing of the sort, as in the high-pressure type of self-starter a quantity of acetylene is used at a pressure far beyond that of two atmospheres, at which the gas becomes explosive, while in the low-pressure type, dangerous mixtures of acetylene and air are employed, compressed to a considerable extent by hand, and here the possibility of the firing back of this mixture must be difficult to prevent."

Thus though the eminent engineer's views are at variance with those that are held in America, the fact remains that the use of acetylene engine starters in England really is illegal, though several manufacturers equip their cars with them—incidentally, they are of American make—and as yet no accidental explosions have been recorded nor have the police authorities exercised their prerogative to prohibit their use. In consequence of these facts, and particularly in view of American experience with compressed acetylene, Branston's views, which were published in the Automobile Engineer, would seem to be hypothetical. In arriving at his conclusions, however, he reviews briefly the facts which have prompted British authorities to overlook the use of compressed acetylene, when stored in steel cylinders, and his dissertation is interesting if for no other reason than that it tends to show how thorough(?) was the investigation upon which the British laws are based.

"When the use of acetylene gas acquired a sudden popularity as a result of the independent and simultaneous discoveries, in 1892, of Moissan and Willson concerning the commercial manufacture of calcium carbide," he says, "the Home Office (with a cautiousness for which one may perhaps doubt the necessity) in February, 1897,

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brought this, in itself, harmless substance (calcium carbide) within the provisions of the Petroleum Act, 1871, which probably has done not a little towards impeding the extension of the use of acetylene for illuminating and other purposes.

"Most of us will remember the numerous serious accidents in the shape of explosions which occurred during the middle nineties, chiefly in France, and which were due, to some extent, to the ignorance of the generator manufacturers of the principles involved in the safe generation of this gas. But in the majority of cases the cause was traceable to the unwarrantable ignorance and gross carelessness of those in charge of the apparatus, an ignorance and carelessness which, at the present time, seems to find its scope in causing the lamentable accidents due to the use of petrol, which are so frequently reported. It was only natural, therefore, that when the properties of this gas had been thoroughly investigated, restrictions should be placed upon its manufacture and use under certain circumstances. Thus an Order in Council of November, 1897, limits the pressure under which it may be stored or used to 100 inches of water (3.6 lb. per sq. in.) in view of the fact that at a pressure of 30 lb. the gas becomes explosive. Acetylene above this pressure is placed within the provisions of the Explosives Act, 1875.

"With a view to improving the illuminating qualities of oil gas for train lighting purposes, Gerdes and others conducted numerous experiments in Germany to find a mixture of acetylene and oil gas which could safely stand compression, and in March, 1898, the Home office authorized the use of a mixture of 20 per cent. acetylene with oil gas at a pressure not exceeding 150 lbs. per sq. in. The facility with which acetylene is liquefiable (at a pressure of 21.5 atm. at 0° C.) seemed to promise a convenient way of storing the gas in bulk, but its unfortunate property of explosibility soon put an end to this. Our knowledge of the properties of compressed, liquid and dissolved acetylene is due chiefly to the exhaustive researches of Berthelot and Vieille. Acetylene when compressed beyond two atmospheres becomes explosive—i. e., it is liable to detonate without the presence of air. Berthelot and Vicille, however, found that to cause it to detonate either through shock or, to a lesser extent, the external application of heat, was a far from easy matter and one not likely to occur in practice, though the possibility of the occurrence was, of course, sufficient to prohibit its use. In 1897 Claude and Hess had observed that one volume of acetone at 15° C. and at atmospheric pressure dissolves 25 volumes of acetylene, while at a pressure of 12 atmospheres this rises to 300 volumes. A rise in temperature, however, causes a rapid decrease in the solubility in acetone which only amounts to one-half of the above figures at 50° C.

"Berthelot and Vieille made numerous experiments with solutions of acetylene in acetone and found that at a pressure of about 10 atmospheres no explosion can take place in the heart of liquid itself; also the pressure of an explosion (caused, e. g., by the detonation of the free gas standing above the liquid) is but one-tenth of that which corresponds to the spontaneous dissociation of all the acetylene present. If, however, the pressure be raised to 20 atmospheres or more, the explosive pressure rises nearly to the same height as that due to an explosion of liquid acetylene. It should be mentioned that the pressure of explosion also varies according as to whether the detonation is produced in the liquid itself or in the gas above it. The difference just mentioned is due to the fact that in the first case the acetone is destroyed at the expense of, and by, the heat of the burning acetylene, and therefore absorbs part of the heat due to the explosion of the latter; in the second case the acetone is decomposed by the shock of the explosion, and this decomposition causes a large increase in volume, or in pressure if at constant volume.

"Storing acetylene dissolved in acetone in steel cylinders is impracticable and dangerous, as the liquid contracts as it releases the gas, so that a space is left in the container, filled with gas at a dangerous pressure. This difficulty has been ingeniously overcome by filling the container with a porous substance such as kieselguhr, into the minute interstices of which the acetone with the acetylene in solution is forced, or even the acetylene by itself without a solvent. The principle upon which the safety of this method of storage rests is that the acetylene or its solvent is contained in cells, the dimensions of which are below those which will permit the propagation of the explosive wave.

"In accordance with these results, the Home Office has permitted the use of acetylene, either compressed or dissolved in acetone, when stored in steel cylinders which are completely filled with porus matter, the pressure not to exceed 150 lb. per sq. in. (Order in Council, April, 1901.) In connection with dissolved acetylene, it may be interesting to mention incidentally that, according to Wolff and Caro, the upper explosive limit of acetylene is reduced by 16 per cent. when acetone is the solvent used, owing to the presence of some of the solvent held in suspension by the gas on leaving the container. The wide explosive range of acetylene-air mixtures (2.5—80 per cent. according to Gerdes; 2.9—64 per cent. according to Le Chatelier) is the reason why the Home Office has prohibited all mixtures of acetylene and air, whatever their proportions or pressure (July, 1900) the mixing which occurs in the burner itself and the air unavoidably introduced into a generator in charging, being necessary exceptions, of course. From the preceding it is clear that, as the law stands at present, the use of acetylene self-starters is illegal. Though the Home Secretary has the power to make an exception, as in the cases mentioned above, it is sincerely to be hoped that he will do nothing of the sort, as in the high pressure type of self-starter a quantity of acetylene is used at a pressure far beyond that of 2 atmospheres at which the gas becomes explosive, while in the low pressure types dangerous mixtures of acetylene and air are employed, compressed to a considerable extent by hand, and here the possibility of the firing back of this mixture must be difficult to prevent."

Cheaper Rubber is Predicted Abroad.

That the price of rubber is due to take a tumble in the near future appears to be an opinion that prevails abroad in several apparently well-informed quarters. Nor are these opinions based upon the possibility of the early realization of sundry dreams of the production of synthetic rubber at ridiculously low cost. It is pointed out by more than one of those who have expressed their views, that at the time rubber "plungers" were more than numerous, and as one of the results of the activities immense tracts of land were planted to rubber in the expectation of immense profits accruing. But, as every one knows, rubber trees require a long term of years in the soil before they become of commercial value. And in the year 1914, according to the views of the experts, the trees will have reached to the state of maturity where the production of rubber will be almost immeasurably increased. Hence the optimistic views and the oft-reiterated prediction that in all probability rubber soon will be standardized in the vicinity of 75 cents a pound. At present, up-river fine Para is listed at $1.15, around which figure it has hovered since the first of the year. Whether or not the predictions will come true remains to be seen, but in the meantime, in expectation of their fulfilment, it is said that the Road Board and the Local Government Board in Great Britain both are holding off from promulgating new laws regarding the use of rubber and steel tired vehicles until the price of raw material reaches a lower level.

Removing Dents from Metal Bodies.

The removal of a dent from the aluminum or sheet steel body of a motor car is a "pretty" job for the experienced body painter. The surface of the metal is first cleaned, then touched up with metallic paint so that the putty which next is applied to fill the cavity will get a "bite." After the putty has set, the whole is rubbed down with sandpaper and painted or finished off with varnish.

With the steel sheet panel, however, trouble sometimes is caused by the formation of rust which, if it has not penetrated too deeply, can be removed with a wire brush and sandpaper. The surface should then be given a coat of anti-rust paint and the putty applied and the job finished in the usual manner. Where the rust has penetrated too deeply for removal with the brush and sandpaper the sand blast must needs be resorted to.

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1,011,431. Motor Driven Vehicle. John B. Heverling, St. Louis, Mo. Filed Mar. 23, 1910. Serial No. 551,136.

1. In a motor driven vehicle, a driving axle, a friction wheel carried thereby, a vertically moving motor driven friction wheel adapted to engage the surface of the first mentioned friction wheel, and means for simultaneously elevating the motor driven friction wheel, and tightening the band brake on the first mentioned friction wheel.

1,011,471. Pneumatic Tire. William A. McCool, Beaver Falls, Pa., assignor to Hercules Tire & Rubber Company, a Corporation of Delaware. Filed Dec. 11, 1909, Serial No. 432,580. Renewed Apr. 11, 1911. Serial No. 620,460.

1. A pneumatic tire, consisting of a plurality of layers of elastic material and composed largely of rubber, and which tire is thickly studded throughout its body portion, including the parts thereof which come near the rim of the wheel, with pegs passing through said layers and strongly securing the same together.

1,011,480. Internal Combustion Engine. Alden E. Osborn, New York, N. Y. Filed Mar. 11, 1910. Serial No. 548,748.

1. An internal combustion engine comprising a working cylinder provided with an extension in line therewith at its upper end constituting a main valve chamber and having an annular valve chamber surrounding the same, and a distributing passage connecting them, a main valve mounted within the first said chamber for controlling the inner end of the said distributing passage, an annular valve mounted in the second said valve chamber for controlling the outer end of the said distributing passage, and means for operating the valves.

1,011,520. Combined Internal Combustion and Fluid Pressure Engine. Harry Benwell Stocks, Manchester, England. Filed Nov. 25, 1910. Serial No. 594,193.

1. In combination, an internal combustion engine, a steam generator into which water heated by the cylinders of the internal combustion engine is pumped, a compressor to force exhaust gases from the engine into the steam generator, and a steam cylinder in which steam from the steam generator is used, substantially as described.

1,011,560. Shock Absorbing Mechanism. Adolph J. P. Bertschy, Chicago, Ill. Filed May 20, 1908. Serial No. 433,799.

1. In a vehicle, a frame, axles supporting said frame, a set of upper cushioning devices, a set of lower cushioning devices, said sets of cushioning devices being adapted to use a fluid cushioning between said frame and said axles, means for exerting pressure on the cushioning medium by the vibrations between said frame and said axles, means for automatically supplying the cushioning devices with the medium thus placed under pressure, a dash board for said vehicle, means on said dash board for controlling the upper set of cushioning devices either independently or collectively, means on said dash board for regulating the lower set of cushioning devices either independently or collectively, and means on said dash board for simultaneously controlling all the cushioning devices.

1,011,591. Driving and Steering Mechanism for Motor Vehicles. William Henry Douglas, Belleville, N. J., assignor to Healey & Co., New York, N. Y. Filed June 21, 1910. Serial No. 568,142.

1. A motor vehicle provided with a driving and steering wheel having a hub and a rim, a driving axle, a universal joint connecting the driving axle with the hub, a steering knuckle intermediate the hub and rim, the said steering knuckle being approximately ring shaped and formed in sections, means for securing the sections of the knuckle together, the said sections each having an annular inwardly extending flange, approximately at the center thereof, ball bearings interposed between the said flanges of the sections of the knuckle and the outer side of the hub, and a supporting member having arms provided with trunnions engaging said knuckle at the top and bottom thereof.

1,011,638. Spring Wheel. William Morris, Cleveland, Ohio. Filed Nov. 14, 1906. Serial No. 343,332.

1. The combination of a hub, telescoping spokes carried thereby, trunnions carried by said spokes, wheels on said trunnions, and a tread portion having inner peripheries on which said wheels ride.

1,011,641. Carburetter. John Anderson Paterson, Wellington, New Zealand. Filed May 19, 1909. Serial No. 497,075.

1. In a carburetter for internal combustion engines, the combination with a chamber through which the exhaust from the engine is passed, of a carburetting member located within such chamber, means for conducting air to the carburetter, and means for conducting air for attenuating the generated mixture of vapor and air, both said air conducting means being adapted to be heated by the gases in said exhaust chamber.

1,011,679. Resilient Wheel. John Vollman, Racine, Wis., assignor of one-third to Peter De Vogel, Racine, Wis. Filed Dec. 3, 1910. Serial No. 595,455.

1. In a resilient wheel, an inner channeled rim with its flanges extending outwardly, an outer rim spaced from said inner rim and composed of a plurality of segmental sections hingedly connected at their ends, one end of each section having apertured outer lugs at the side edges thereof and the other end having similar inner lugs spaced from the side edges and from each other, said last mentioned lugs being adapted to be arranged between the outer lugs of the adjacent sections, bolts connecting the lugs of said sections, plate springs having cylindrical lugs on one face at one end thereof arranged between said inner lugs and engaged by said bolts, the said springs having flanges extending beyond the opposite ends of the lugs thereof and adapted to overlap and bear on the lugs of the tire sections, and means for connecting the free ends of said springs to the inner rim.

1,011,696. Carburetter. Alexander Winton, Cleveland, Ohio. Filed May 12, 1911. Serial No. 626,795.

1. In a carburetter, the combination of a main carburetting chamber, an auxiliary carburetting passage having its two ends communicating with the ends of the main carburetting chamber, a gasolene supply for the auxiliary passage, a gasolene supply located in the main carburetting chamber at a point between the ends of said auxiliary carburetting passage, and throttles in the main carburetting chamber controlling the passage of the mixture through the main carburetting chamber and the auxiliary carburetting passage.

1,011,834. Friction Clutch. Harry W. Nichoalds, Detroit, Mich., assignor to John B. Whelan, Detroit, Mich. Filed Oct. 10, 1910. Serial No. 586,185.

1. In a friction clutch in combination with a driving shaft a casing fixed thereto and provided with a cavity having oppositely inclined friction faces, a plurality of radially arranged friction members adapted when expanded to engage said friction faces, wedge members adapted to engage therebetween, whereby said friction members may be forced centrifugally, resilient means for normally holding said wedge members in expanding position with reference to said friction members, and means for releasing said wedge members and thereby said frictional members from such position, thereby terminating the frictional engagement, substantially as described.

1,011,860. Electric Tire-Vulcanizer. Frederick F. Schwentker, Schenectady, N. Y., assignor to General Electric Company, a Corporation of New York. Filed Apr. 17, 1906. Serial No. 312,119.

1. An electric tire vulcanizer comprising a metallic body portion of relatively hard metal, an electric heating unit secured thereto, and a mass of softer metal molded to the body in the shape of a tire and in heat conductive relation with said unit.

1,011,875. Internal Combustion Engine. Charles A. Sullivan, Windsor, Ontario, Canada, and James W. Potter, Detroit, Mich., assignors of one-fourth to Edward J. Woodison and one-fourth to Charles L. Ackerson, Detroit, Mich. Filed Mar. 4, 1910. Serial No. 547,191.

1. An internal combustion engine, having in combination a fixed cylinder, a piston, a member intermediate said cylinder and piston, arranged to act as a piston with respect to said fixed cylinder, and as a cylinder with respect to said first-mentioned piston, a crank shaft, pitman connections between said crank shaft and intermediate member and piston adapted to cause the same to alternately approach and separate, said fixed cylinder having a fuel inlet port uncovered by said intermediate member near the limit of its outward stroke, a by-pass in said fixed cylinder having an opening into the clearance space thereof, and another opening adapted to register with the clearance space of the intermediate member when the intermediate member is reaching the limit of its compression stroke in the fixed cylinder, said by-pass adapted to transfer fuel through the chamber of the fixed cylinder to the chamber of the intermediate member, said intermediate member also provided with a port leading from its clearance space, and adapted to register with said last-mentioned opening of said by-pass, thereby establishing communication therethrough between said fixed cylinder and intermediate member, and a firing plug introduced through the walls of the fixed cylinder, with which the said port of the intermediate member is adapted to register when the piston and intermediate member are near their closest condition of approach, substantially as described.

1,011,892. Wind Guard for Vehicles. Martin L. Williams, South Bend, Ind. Original application filed Feb. 11, 1908, Serial No. 415,276. Divided and this application filed Nov. 21, 1908. Serial No. 463,738.

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1. A windguard for vehicles comprising an upright lower sash, supporting brackets connected with the upper portions of the sash at each side and extending laterally therefrom, an upper sash, links connecting the sides of the upper sash with said supporting brackets at points remote from the lower sash, means for locking said upper sash either in alinement with the lower sash, or in tilted relation to the lower sash with its lower edge offset and spaced away from the upper edge of said lower sash, and means for supporting the lower end of said upper sash when lowered into position alongside of, and approximately parallel with the lower sash.

1,011,894. Tire. William H. Reed, Hartford, Conn., assignor to Revere Rubber Company, Providence, R. I., a Corporation of Rhode Island. Filed May 14, 1910. Serial No. 561,289.

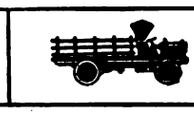
1. In a wheel tire the combination with the felly and a bevel edged metallic band secured thereto, of a series of bevel edged base plates adapted for arrangement end to end on said band, clamps adapted to engage the bevel edges of said band and base plates, means for moving said clamps to firmly secure said base plates to said band, and a tread block permanently secured to each base plate.

1,011,931. Force Feed Carburetter. Charles W. Farquharson, Chicago, Ill. Filed Oct. 13, 1910, Serial No. 586,924. Renewed Nov. 8, 1911. Serial No. 659,247.

1. A force feed carburetter comprising a charge supply tube a carburetter casing arranged thereon and connected thereto, an oil conducting pipe extending through said casing and having inlet and discharge valves, a reciprocating member alined with said oil pipe, a pipe for admitting fluid pressure to said member, a hollow flexible connection between said pipe and said member, a hollow flexible connection between said member and the oil conducting pipe, a



INDEX TO ADVERTISERS



A

Abbott Motor Car Co..... 74
Adamson Mfg. Co..... 72
Ajax-Grieb Rubber Co..... 60
American Ball Bearing Co..... 6
American Motors Co..... 17
American Starter & Carburetor Mfg. Co..... 71
Argo Electric Vehicle Co..... 68
Atwater Kent Mfg. Works..... 60
Automobile Supply Mfg. Co..... 68

B

B & L Caster Axle Co..... 68
Badger Brass Mfg. Co..... 74
Bantam Anti-Friction Co..... 71
Barthel, Daly & Miller..... 66
Bartholomew Co. 70
Benz Auto Import Co..... 69
Billings & Spencer Co..... 64
Bosch Magneto Co..... 67
Bossert Co. 59
Bretz Co., J. S..... 73
Briggs-Detroiter Co. 70
Brown-Lipe-Chapin Gear Co..... 71
Bush Mfg. Co..... 60

C

Cartercar Co. 70
Champion Ignition Co..... 68
Champion Spark Plug Co..... 76
Clark-Carter Automobile Co..... 72
Classified Advertising 58-59
Colonial Electric Car Co..... 74
Consolidated Mfg. Co..... 74
Continental Motor Mfg. Co..... 59
Covert Motor Vehicle Co..... 13
Cox Brass Mfg. Co..... 71
Cramp, Wm., & Sons, Ship & Engine Building Co. 73

D

Dayton Auto Truck Co..... 74
Dayton Rubber Mfg. Co..... 59
Dean Electric Co..... 16
Detroit & Cleveland Navigation Co... 76
Diamond Chain & Mfg. Co..... 73
Diamond Rubber Co..... 73

E

Electric Welding Products Co..... 76
Empire Automobile Co..... 75
Empire Tire Co..... 72

F

Fedders Mfg. Works..... 63
Federal Miniature Lamp Works..... 60
F. I. A. T..... 74
Fireproof Garage Co..... 56
Firestone Tire & Rubber Co..... 69
Ford Motor Co..... 75
Frankiln Automobile Co..... 75

G

G. C. A. Mfg. Co..... 71
Goodyear Tire & Rubber Co..... 60
Grant-Lees Machine Co..... 59
Great Northern Hotel..... 66
Grossman Co., Emil..... 59
Guide Motor Lamp Co..... 56

H

Hartford Auto Parts Co..... 1
Hartford Suspension Co..... 56
Havers Motor Car Co..... 70
Hayes Mfg. Co..... 18
Haynes Automobile Co..... 74
Henderson Motor Car Co..... 69
Hodge & Graves Co..... 73
Hupp Motor Car Co..... 75
Hyatt Roller Bearing Co..... 71

I

Ignition Starter Co..... 59
Inner Shoe Tire Co..... 60
International Accessories Corp..... 71
International Harvester Co. of America 64
Inter-State Automobile Co..... 69
Invincible Starter Co..... 71

J

Jackson Automobile Co..... 75
Jeffery-Dewitt Co. 76
Jencick Motor Corp..... 69
J-M Shock Absorber Co..... 65
Jones & Co., Phineas..... 76
Jones Speedometer 76

K

Kellom Co., Chas. F..... 60
Kelly-Springfield Tire Co..... 61
King Motor Car Co..... 68
Kinsey Mfg. Co..... 72
Kissel Motor Car Co..... 72
Kline Motor Car Corp..... 70
Knight-Davidson Co. 72
Knox Automobile Co..... 21

L

Lauth-Juergens Motor Car Co..... 67
Leather Tire Goods Co..... 59
Lippard-Stewart Motor Car Co., Inside front cover
Locomobile Co. 60
Lovell-McConnell Mfg. Co., Inside back cover

M

Mais Motor Truck Co..... 70
Mayo Radiator Co..... 3
McCue Co. 20
McGraw Tire & Rubber Co..... 59
Metz Co. 60
Michigan Buggy Co..... 72
Michigan Crank Shaft Co..... 60
Miller, Chas. E..... 3
Mosler & Co., A. R..... 59
Moss Photo Engraving Co..... 66
Motor Car Equipment Co..... 60
Mott Wheel Works..... 76
Motz Tire & Rubber Co..... 60
Mutty Co., L. J..... 60
M & P Electric Vehicle Co..... 15

N

National-Acme Mfg. Co..... 63
National Gas Engine Starter Co..... 14
National Motor Vehicle Co..... 75
New Departure Mfg. Co..... 68
Niagara Sales Co..... 66
Nordyke & Marmon Co. 75

O

Owen & Co., R. M..... 60

P

Parish & Bingham Co..... 73
Penn Motor Car Co..... 5
Penn Spring Works..... 56
Perfection Spring Co..... 59
Piel Co., J..... 4
Pierce-Arrow Motor Car Co...Front cover
Prest-O-Lite Co. 59
Pullman Motor Car Co..... 8-9

R

R. C. H. Corporation..... 12
Regal Motor Car Co..... 7
Remy Electric Co..... 67
Republic Rubber Co..... 59
Royal Equipment Co..... 62

S

Schrader's Sons, A., Inc..... 65
Shawmut Tire Co..... 74
Sheldon Axle Co..... 2
Smith Co., A. O..... 69
Sparks-Withington Co..... 62
Speedwell Motor Car Co..... 75
Splitdorf Electrical Co..... 73
Springfield Metal Body Co..... 60
Standard Roller Bearing Co..... 60
Standard Welding Co..... 19
Stearns Co., F. B..... 70
Studebaker Corporation.....Back cover

T

Timken-Detroit Axle Co..... 11
Tobias, F. H..... 59
Twitchell Gauge Co..... 61
Typhoon Signal Co..... 59

U

United Rim Co..... 76
United States Tire Co..... 68

V

Valentine Co., J. H..... 64
Volkmar Auto Starter Co..... 73

W

Warner Gear Co..... 65
Warner Instrument Co..... 10
Weed Chain Tire Grip Co..... 60
Western Motor Co..... 70
Willard Storage Battery Co..... 59
Willys-Overland Co. 22
Wisconsin Motor Mfg. Co..... 69
Woodstock Hotel 67

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fixed support for said member between the flexible connections, a flange on said member, and a sleeve adjustably mounted in said support in the path of the flange.

1,011,940. Rain and Wind Shield for Automobiles. Anna K. Gilson, Quechee, Vt. Filed Aug. 15, 1911. Serial No. 644,219.

A shield for vehicles comprising a flexible frame, a flexible transparent medium supported by said frame having an opening of limited area, a flexible closure hinged to swing to and from said opening, and a supporting arm hinged at one end to the flexible frame having means at its other end for connection with the closure, and movable to and from a position parallel with the frame side to which it is pivoted.

1,011,977. Ignition Apparatus for Hydrocarbon Engines. Allen Loomis, Detroit, Mich., assignor, by mesne assignments, to Packard Motor Car Company, Detroit, Mich., a Corporation of Michigan. Filed Dec. 27, 1907. Serial No. 408,231.

1. In an ignition system for hydrocarbon engines for motor vehicles, the combination with a plurality of engine cylinders, of a spark plug on each cylinder, a plurality of separate insulated conductors, a tube containing said conductors passing in proximity to said spark plugs and having an opening opposite each plug, a holder secured to said tube at each of said openings, a terminal member within each holder making electrical contact with one of the conductors, and pivoted switch arms supported by said holders in position to make contact with the spark plugs thereby making electrical connection between the terminals and plugs.

1,011,987. Wheel. Irving D. Minor and Frank A. Minor, Aurelia, Iowa. Filed Jan. 24, 1911. Serial No. 604,452.

1. In a wheel, a disk adapted to be connected to an axle and provided with an outwardly directed annular recess, an inner rim concentric to the disk and provided with an inwardly directed annular recess, a tire formed in two annular portions with lateral flanges engaging face to face and fitting respectively in said annular recesses, said flanges each having a plurality of open slots, clamp devices extending through the disk and through the slots in one pair of said flanges, and clamp devices extending through the inner rim and likewise through the slots of the other pair of said flanges.

1,012,033. Spring Wheel. Paulus Franciskus van Keep, Breda, Netherlands, assignor to The Firm of Amsterdamsche Maatschappij tot Exploitatie van Uitvindingen, Amsterdam, Netherlands. Filed June 3, 1908. Serial No. 436,452.

1. In a spring wheel, the combination with a felly and a hub, of a spring spoke having a spiral end connected to the felly and a leaf spring end connected to the hub, and abutments on the hub between the points of connection of said spokes with the felly and hub and on opposite sides of the spokes and independent of the end connections to produce flexure of the leaf spring portion upon relative rotation of the hub and felly in either direction.

1,012,115. Rotary Explosive Engine. Frederick Uhtbrock, New York, N. Y. Filed Sept. 25, 1908. Serial No. 454,817.

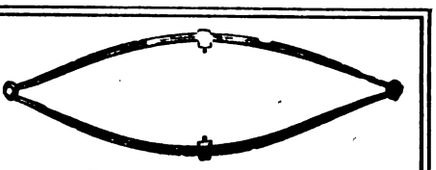
1. In a rotary explosive engine, a stator formed by a circular disk with a cylindrical rim; an annularly grooved rotor circumferentially surrounding said stator and rotatably mounted on the rim of the latter and forming a circular chamber with the same; three hollow pistons integral with or fastened to said rotor and dividing the circular chamber formed by the rotor and the stator into three chambers; partitions carried by the rotor and the pistons and located in the plane of the circular disk of the stator and running parallel to the sides of the rotor and dividing the chambers formed by the stator, the rotor and the pistons into compression and explosion chambers; inlet and outlet valves located in the pistons, the inlet valves facing the compression chambers, and the outlet valves facing the explosion chambers; radially reciprocatable abutments provided with rollers and having cuts into which fit the before-mentioned partitions; four lugs integral with or fastened to the stator, forming frames for said abutments; valved feed-ports situated one on either side of the frames of the abutments and leading into the compression chambers; valved exhaust-ports situated one on either side of the frames of the abutments and communicating with the explosion-chambers; guides carried by the rotor and adapted to guide the abutments into the compression and explosion chambers and out of the way of the pistons by means of the rollers fastened to the abutments; means to open the outlet valves of the pistons at and for a predetermined time; means to ignite the charges in the explosion chambers at the proper time; and means to open or to close the feed and exhaust valves and means to set in position the means that operate the outlet valves of the pistons; means of supply leading to the feed-ports and means to conduct the exhaust away from the exhaust ports; all substantially as described.

1,012,116. Cranking Device for Gas Engines. William Van Scoter, Buffalo, N. Y., assignor of one-fourth to William J. Hayes, Buffalo, N. Y. Filed Feb. 13, 1911. Serial No. 608,274.

1. A cranking device for gas engines comprising a starting shaft adapted to be connected with the engine shaft and provided with a laterally projecting coupling pin, a crank mounted loosely on the starting shaft and provided with a sloping driving shoulder adapted to engage with said pin, and a spring operating to move said crank axially and hold said shoulder yieldingly in engagement with said pin.

1,012,127. Shock Absorber. Thomas G. Cushman, Sunland, Cal. Filed May 23, 1911. Serial No. 628,903.

1. In combination with a vehicle having an axle and a frame spring supported thereon, a link pivoted at one end to the frame and extending diagonally downwardly toward the axle, another link pivoted to the axle and extending diagonally upwardly and toward the free end of the first mentioned link, and a resilient member connected to the adjacent ends of the links and connected to the frame.



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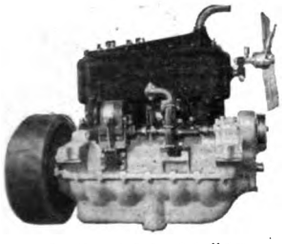
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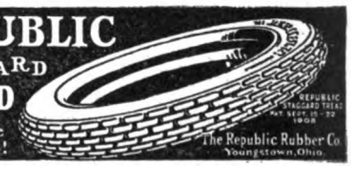


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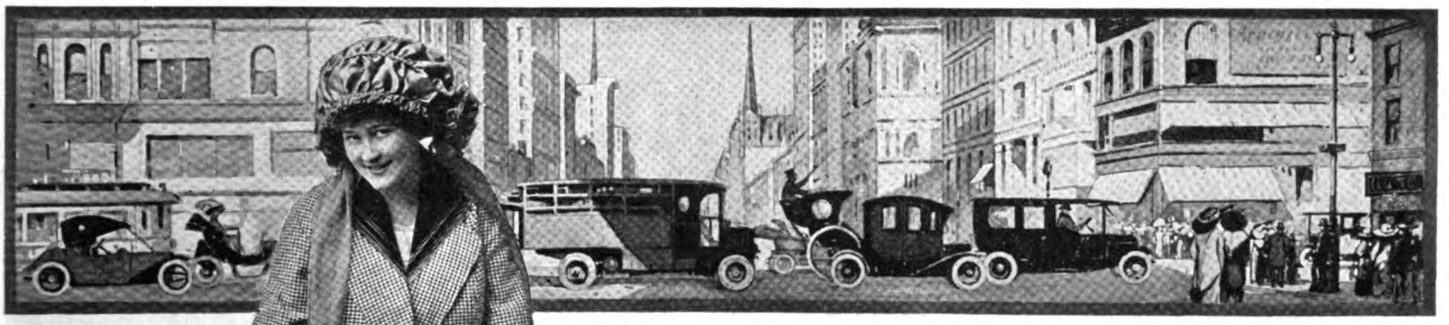
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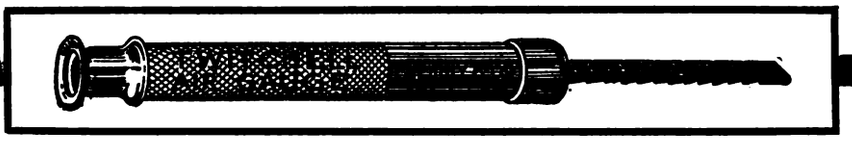
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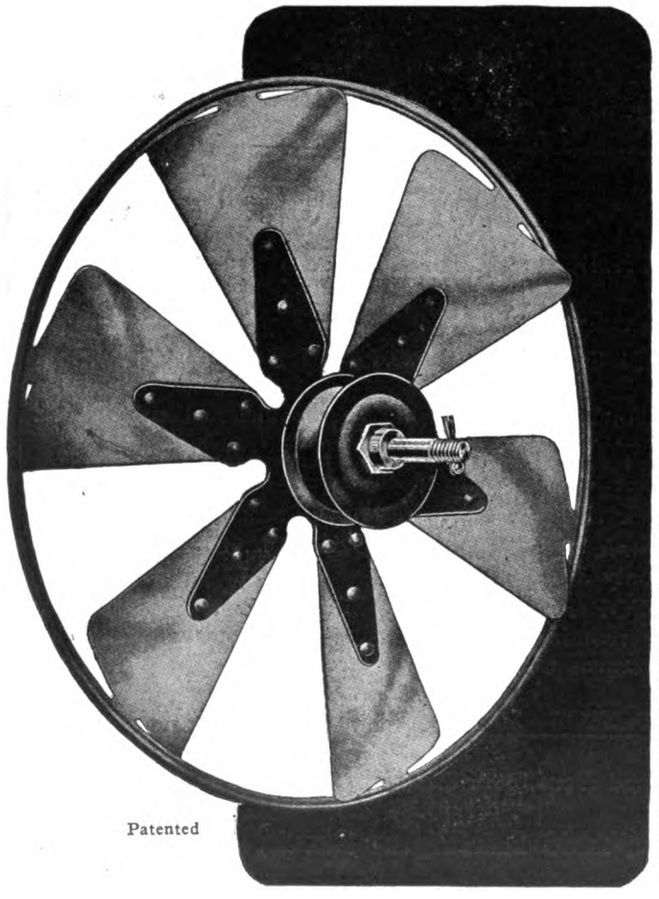
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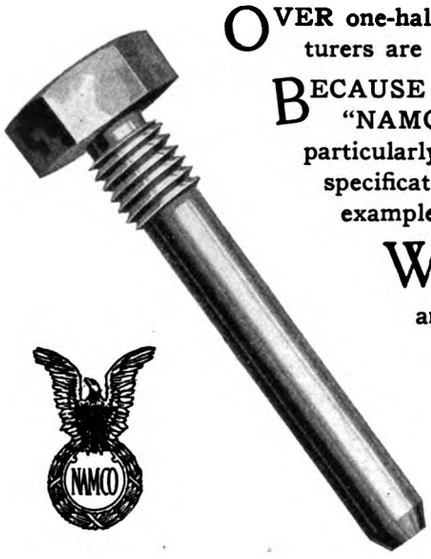
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OVER one-half the parts used by automobile and accessory manufacturers are produced the "ACME WAY."

BECAUSE they understand the reliability that may be placed in "NAMCO" products. In addition, our price, delivery and service is particularly attractive to customers. Let us quote on your samples and specifications. Our Book, "Parts for the Trade," shows over two hundred examples of parts made for our customers. It will be sent on request.



WE CARRY in stock for immediate delivery a complete line of caps and set screws with U. S. S. or "V" threads and A. L. A. M. screws and nuts, either plain or castellated. We furnish parts in large quantities on a contract basis.

THE NATIONAL-ACME MANUFACTURING CO.
CLEVELAND, Sixth City

NEW YORK, 77 White St. DETROIT, 1222 Majestic Bldg. ATLANTA, 3rd National Bank Bldg.
BOSTON, 141 Milk St. CHICAGO, 549 So. Jefferson St. MONTREAL, St. Henry & G. T. R.
FACTORIES: Cleveland, Montreal, WAREHOUSES: New York, Chicago

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AUTOMOBILE **All Sides Surrounded by Water**



REAL square tube radiators—such as the Fedders—do not clog up and lose their efficiency after a few months of use.

The water channels are both vertical and horizontal. This not only helps to obviate the danger of clogged tubes but insures the maximum cooling surface as well.

Real square tube radiators are easily repaired in the event of an accident whereas most other types call for a return to the factory or an unsatisfactory job. A pair of tinner's irons is all that is needed to repair a square tube radiator.

Fedders Manufacturing Works
BUFFALO, NEW YORK

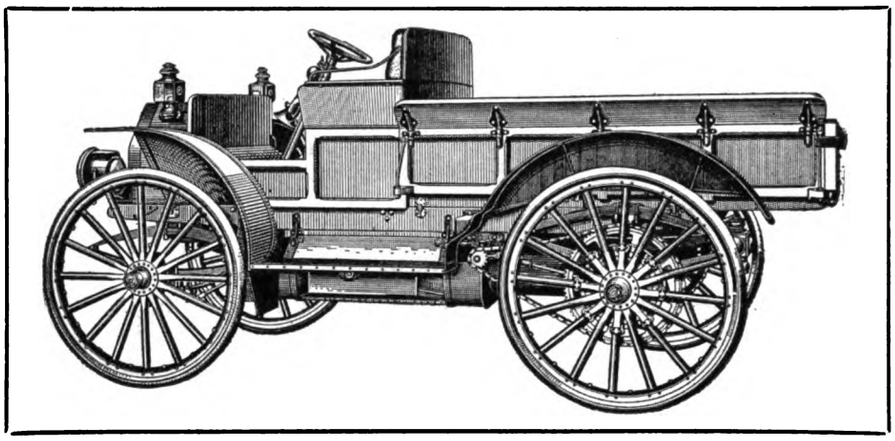
RADIATORS

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Every Business Man Is a Prospect for the International Commercial Car

Every man who wants to make quick deliveries, who has to transport tools or material for his work, or who has any kind of light hauling to do, is a prospect for an International Commercial Car.

The selling field of this handy, dependable auto wagon is unlimited because of its general usefulness, and because it gives such universal satisfaction. Wherever a sale is made it helps to close others. The endless chain thus formed makes the selling of this car the best opportunity of the present time for automobile dealers who see the trend of the times toward motor cars as business wagons.



The International Commercial Car has been justly called the car of wide appeal. Grocers, bakers, laundrymen, florists, painters, decorators, carpenters, contractors, plumbers, and men in a hundred other lines of business buy this car because of its fair price, low upkeep cost, efficiency and economy.

Any dealer who will distribute our selling literature among the business men of his town, or the farmers of his neighborhood, and will follow up that literature with practical demonstrations of what an International Commercial Car will do, can make a gratifying success of an agency for this car.

We invite correspondence from live dealers who want to be shown. Address a post card to

INTERNATIONAL HARVESTER COMPANY OF AMERICA, Inc., 155 Harvester Bldg., Chicago, U. S. A.

Self Hanna Starter

Watch the Prices Drop!

Just as the Hanna self starter—the only 100% efficient **self** starter that does not foul or soot your plugs—**was imitated** by those who followed our lead so now is **the price** of the Valentine manifold starter being met.

Remember We Were the Originators

Not only were we the first to produce an acetylene **self starter but** we were first to introduce a manifold **self starter at** the right price, $10.

Our Price Does Not Cut the Dealer's Profit

Still some fine territory open. The profit is big. Our **goods are** right and fully guaranteed. Write today.

J. H. VALENTINE COMPANY

Syracuse, New York

The Valentine Manifold Starter and Gas Lighter

Drop-Forged Accurately Assembled

Billings & Spencer Wrenches



The few parts of a Billings and Spencer Wrench are put together with a micrometrical exactness.

None is permitted to leave the factory until it has passed the most rigid examination.

As a result, a defective Wrench is unknown to the man who insists upon getting the triangle trade-mark brand.

A guarantee of a lifetime of service is his further assurance of highest possible quality.

Look for the B. & S. trade-mark on the wrenches you buy. It is put there for your protection.

On sale everywhere. Write today for Catalog.

BILLINGS & SPENCER COMPANY

Hartford, Conn.

THE MARK OF QUALITY B THE BILLINGS & SPENCER CO. HARTFORD

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Mr. Automobilist:

Your tire maker is very anxious to impress upon you the importance of

Tires Inflated to the Right Pressure

He insists that this is tire economy and

Saves You Money

How do you know what pressure you have in your tires? A

SCHRADER
UNIVERSAL
Tire Pressure Gauge

(Trade Mark Registered in U. S. Patent Office)



(Patented March, 1898—Other Patents Pending)

will tell the exact pressure in your tires at any time, day or night, by simply holding this Gauge to your Valve for a second. Its recording sleeve remains in place, showing the exact pressure in the tire so that the Gauge can be taken anywhere and read, at night to the front of the car into the light of the lamps. After the pressure has been ascertained the Indicating Sleeve can be pushed back into the Gauge with your finger. No catches or snaps to operate or get out of order. This Gauge is 2½ inches long over all, short enough to apply easily to the smallest diameter of wheel and can easily be carried in the vest pocket or the change pocket of your trousers.

Price $1.00 Each
Ready for Delivery Now

Guaranteed Simple and Absolutely Accurate

Can be obtained from all tire manufacturers and the dealers, or

A. SCHRADER'S SON, Inc.
28-32 Rose Street New York City

"Look at the rear springs"

if you want to know why some cars ride so comfortably — why comfort is possible when only one or two persons ride in a 7-passenger car.

It's because they are equipped with

"J. M." SHOCK ABSORBERS

which not only *absorb* all jolts and jars, but *actually prevent* them.



By keeping the rear wheels on the ground, the "J. M." secures continuous traction, and eliminates:

First—Racing of the engine when the car jumps the ground.

Second—Grinding of the tires when they hit on the rebound.

This means maximum comfort, increased engine efficiency and decreased tire expense.

Made in three models—attachable in an hour, detachable in fifteen minutes.

Prices, $35 to $50 per set. Write for booklet W, with full information.

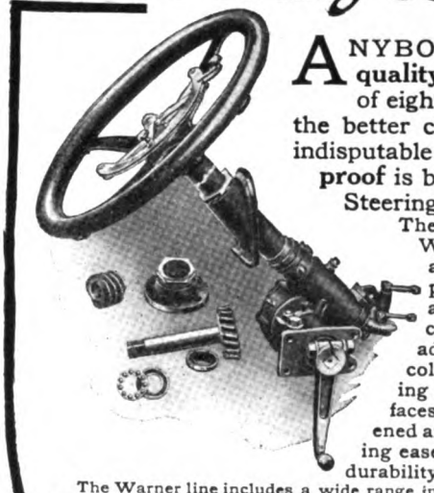
The "J. M." Shock Absorber Co.
Main Office and Factory, 210 South 17th Street, Philadelphia, Pa.

New York, N. Y., 218 West 84th St.
Chicago, Ill., 1509 Michigan Ave.
Boston, Mass., 222 Eliot St.
Buffalo, N. Y., Teck Building.
Rochester, N. Y., 334 East St.
Pittsburgh, Pa., 5919 Baum St.
Baltimore, Md., 10 W. Eager St.
Washington, D. C., 1803 M St., N. W.
Pawtucket, R. I., 41 Dexter St.
Detroit, Mich., 1001 Woodward Ave.

Branches in France, England, Germany, Russia, Belgium, Austria, Italy, Spain, Argentine Republic, South Africa and Australia.

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Steering Gears



ANYBODY can claim quality—but a record of eight years use on the better class of cars is indisputable proof. That proof is back of Warner Steering Gears.

The prime features of Warner Gears are: accessibility; complete interchangeability; use of eccentric sleeves; adjustable angle of column; large bearing and contact surfaces specially hardened and ground, assuring ease of motion and durability.

The Warner line includes a wide range in both pleasure and commercial types.

We guarantee dependable deliveries.

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We modify our designs to meet your detail requirements, or build on approved designs on seasons quantity specifications.

Detroit Office
628 Ford Building

Philadelphia Office
Glenwood Ave. & 2nd St.

Warner Gear Co.
Muncie Indiana

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The Niagara Self Starter

The Niagara Self Starter does not soot or foul your spark plugs, because it mixes the acetylene gas with pure air and forces this mixture into the cylinders of the engine.

Acetylene gas alone deposits soot thickly in your cylinders and upon your spark plugs. Avoid using starters which depend upon pure acetylene gas. Use only the Niagara Self Starter which mixes this gas with the proper proportion of PURE AIR.

The compressor of the Niagara Starter is made of seamless drawn steel tubing with a cast iron piston and two cast iron piston rings.

Factories and agents should write us for our proposition.

THE NIAGARA SALES CO., Buffalo, N. Y.

Schafer Ball Bearings

are built to withstand the most extreme strains and stresses of hardest service.. The durable, wear-resisting chrome steel used in their construction is of exclusive analysis, free from blisters, air bubbles and every intrinsic weakness that might cause the balls to vary in weight, size or structural strength. The balls are uniform to within .0001 part of an inch and remain so over long terms of hard service. Recognized by engineers as the highest grade and finest quality of anti-friction bearings made today. When you equip with Schafer you insure your car against frictional deterioration.

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Great Northern Hotel
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Ideal Headquarters for Automobilists

Rates:
Without Private Bath
$1.50 and $2.00
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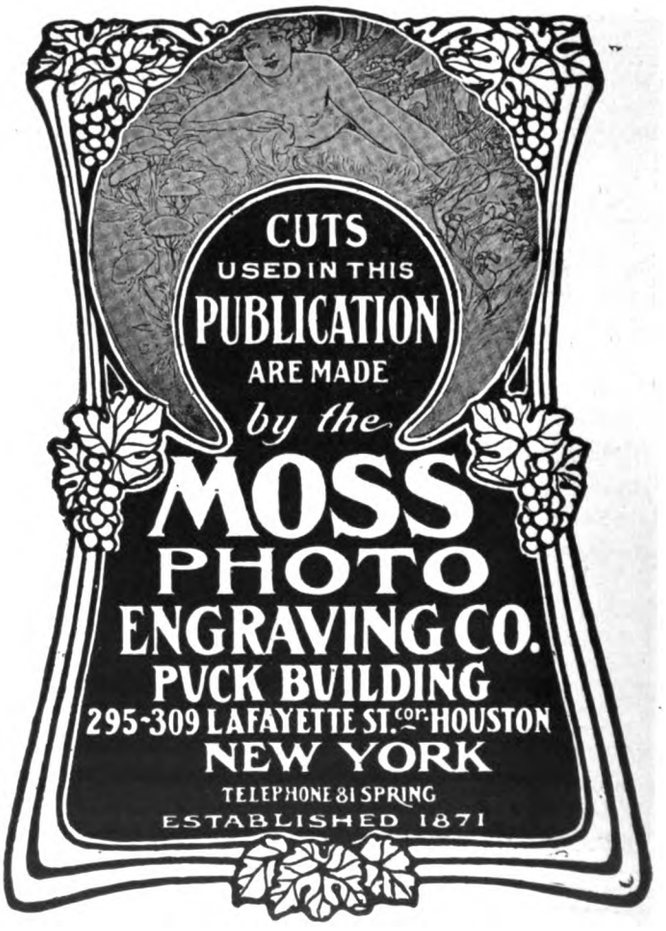


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Most centrally located hotel in Chicago and absolutely of fireproof construction.

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Lauth-Juergens Trucks are Delivery Insurance

QUALITY DURABILITY

ONE, TWO AND THREE TON CAPACITY



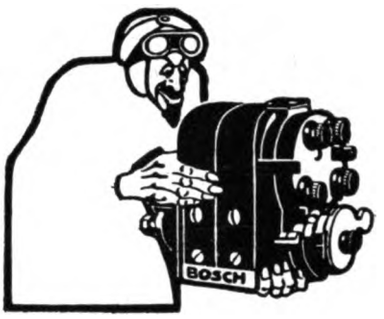
LAUTH-JUERGENS TRUCKS ARE THE LATEST IN CONSTRUCtion, most powerful in operation and the motors are guaranteed against defective workmanship and material for the life of the truck. They are positively the highest class trucks made. Two cylinder, one-ton, four cylinder, one, two and three-ton. Four speeds forward, Hess-Bright ball bearing transmission made in our own shops of the finest tool steel, three-piece disc clutch, covered by patents owned by us. Send for 1912 Catalog and specifications. Prompt delivery on all models. Large publicity campaign just begun. Our quality will do the rest.

Reliable Agents: Secure Your Territory for 1912 at Once.

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CHICAGO—The Lauth-Juergens Motor Car Co., 2630-32 Wabash Ave.
NEWARK, N. J.—Merchants Motor Car Co., Essex Building.
DETROIT, MICH.—Bierl Auto Truck Sales Agency, 453 Dix Ave.
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Efficiency Wins

AT Tacoma, Wash., the Free for All, the Heavy Car, and the Medium Car Races were Bosch Victories—*of course.*

Be Satisfied Specify Bosch

BOSCH MAGNETO COMPANY

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The WOODSTOCK

"You can walk from there to anywhere"

Our new addition is ready for occupancy.
We now have 360 rooms with 265 baths.
Write us for descriptive folder with typical floor plan and rate card.
Wire for reservation at our expense.



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Court room with bath, for one, per day.....$2.50
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W. H. Valiquette, Manager.

Also
"THE BERWICK"
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Exchange Your Old Magneto for a New Remy

IT will cost you practically no more than what you will be forced to pay out for constant repairs on your present ignition system. A new Remy will give your car new life. Here is our exchange proposition:

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Allowance made for any make of Magneto.

Remy Electric Company

Anderson, Indiana

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CANADA—Toronto, Winnipeg, Calgary, Hamilton, Vancouver, Montreal.

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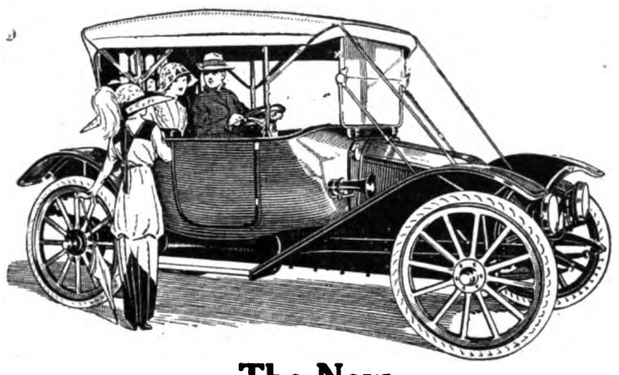
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New Departure Guaranteed Ball Bearings

are in 60% of the 1912 cars. Contracts for 1912 cover 80% of the entire output of American automobile manufacturers next year. Reason—New Departure Ball Bearings have "made good." Have you had our 1912 catalog?

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The New

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Roadster

Has Met with Instant Success

The Argo Roadster is a distinct departure from the old type of awkward, top-heavy electric. It has a long wheel base — low-hung construction — Interlocking foot control — non-reversible wheel steering apparatus—large artillery wheels—bevel gear drive and many other new improvements.

It has all the speed and all the mileage that you are ever likely to need—combined with the safety and convenience of an electric. Noiseless—clean—safe and economical to maintain.

Write For Our Catalog which gives complete description and specifications of the Argo Roadster, Brougham, etc.

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Are not only expected to, but do, give perfect satisfaction and the many thousands now in use demonstrate the fact that they do give perfect service



Torpedo Type

Price $20

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United States Tires



ARE GOOD TIRES

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This name stands for efficiency in

SPARK PLUGS

Used as standard equipment by eighty-one manufacturers.

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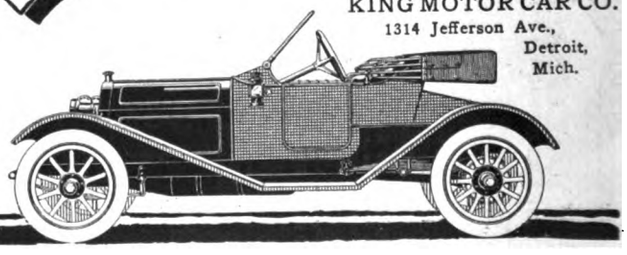
KING

A real roadster—not a roadster body on a touring car chassis. (Perfect distribution of load, with engine seated 8 inches back of front axle.

With Full Equipment, Including Self-Starter, $1190

Terms, territory and detailed description on request.

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B & L CASTER FRONT AXLE

Means to you as a car owner—SAFETY, EASY STEERING and PERFECT CONTROL. Agents should insist that their 1913 cars be equipped with it.

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BENZ AUTO IMPORT COMPANY OF AMERICA
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"Distinctly Complete"

Electrically Self-Started and Lighted — Inter-State — Six Models 40 and 50 H. P. Fully Equipped

Model 40—5 Passenger, Fore Door Touring Car.
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Model 42—Roadster type—all with the splendid new en bloc motor, 4½ inch bore, 5½ inch stroke. 40 H.P..... $2400

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Fully equipped with top, windshield, speedometer, gasoline gauge, 36" wheels, demountable rims, and automatic tire pump.

All fully described in our Art Catalog. Send for one today.

Inter-State Automobile Co., Dept. O. Muncie, Ind.
Boston Branch: 153 Massachusetts Ave. Omaha Branch: 310 S. 18th St.

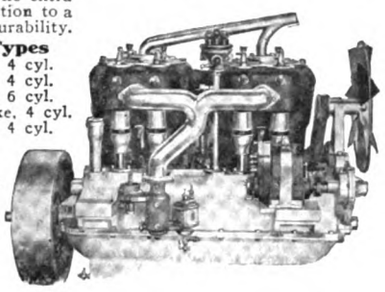
PRESSED STEEL
FRAMES
A. O. SMITH COMPANY
MILWAUKEE

Wisconsin — The Consistent Motors

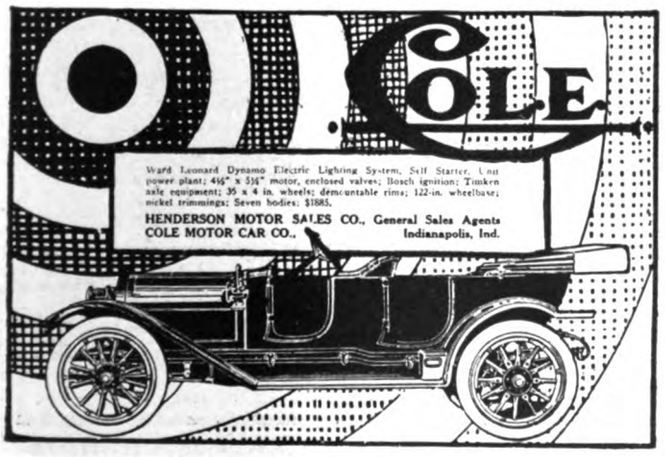
The crank shaft is of large diameter—a self-contained oiling system supplied by a gear pump through the hollow crank shaft provides perfect oiling. The extra large bearings reduce friction to a minimum and increase durability.

All 4 Cycle—in 5 Types
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4¼ in. bore, 5 in. stroke, 6 cyl.
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5½ in. bore, 7 in. stroke, 4 cyl.

WISCONSIN MOTOR MFG. CO.
Dept. 32
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Jencick Motors
OF QUALITY
FOR MOTOR TRUCKS
Jencick Motor Corporation
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are the least likely to require changing, and afford the best means of tire changing when required.

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4 and 6 Cylinder Motors
2, 4, 5 and 7 Passenger Cars

KLINE CAR

4 Speeds Forward
Self-Starting
Detachable Rims

One Quality in All Models

4-30 $1700 $1750 — 4-40 $2200 $2250 — 6-50 $2800 $2850 — 6-60 $3300 $3500

Agents wanted in open territory. Write today.

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Factories: York, Pa., Richmond, Va.

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HAVERS - SIX - HAVERS MOTOR CAR CO.

Havers Self-Starting "Six-44"



Price $1850

SPECIFICATIONS TALK—Six-cylinder Motor, 4-cycle long-stroke type; 44 H. P.; Bosch Magneto; dual system; Model "C" Stromberg Carburetor. 122-inch wheel-base; 36x4-inch wheels; self starter. Springs, semi-elliptic front, platform suspension, rear; rear axle, full floating type.

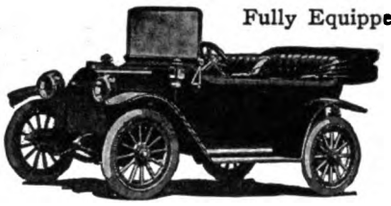
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The Detroiter—$850

Fully Equipped

Five Passenger Touring Car



25 H. P. Long Stroke Motor

Enclosed Valves, Three Point Suspension, Unit Power Plant, Platform Rear Springs, Full Floating Axle, Left Hand Drive, Center Control, Drop Frame, Large Tires, Complete Ball Bearing Car. Write for specifications.

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Internal Gear—Not Chain—1½ and 2½ Tons

THE MAIS AGENT figures his profit when a truck is sold. It is not a modified pleasure car, but is built in factories for trucks only. Its maintenance expense is no more year after year than when first demonstrated. Its parts are interchangeable, you don't need a machine shop. All parts enclosed and lubricated.

It is a Certainty

Dealers Will Receive Personal Attention

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Climbs a 50% grade—Friction Transmission—any number of speeds. Five models—write.

CARTERCAR COMPANY, Pontiac, Michigan

This Year it's the Glide 36-42

1912 WRITE FOR AGENCY TODAY

ANYONE who will take the time to investigate the merits of the $1550 "Glide" and compare it with cars costing $1000 more and over, can prove for himself why the "Glide" is best. Send for handsome book and learn of the

5 to 7 Years' Service

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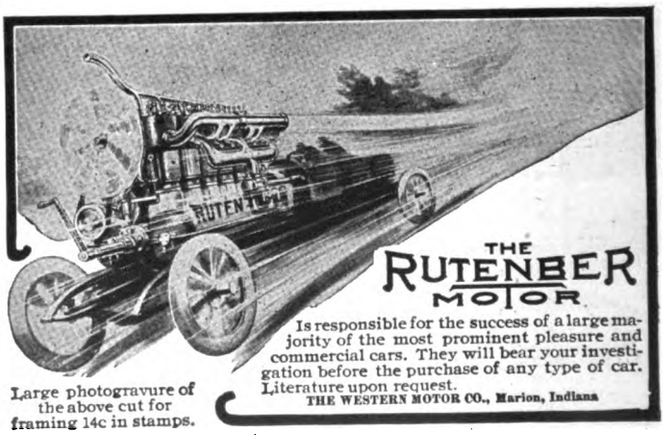
THE BARTHOLOMEW COMPANY, 220 Glide Street, PEORIA, ILL.

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THE ULTIMATE CAR
(KNIGHT TYPE MOTOR)

The first American Car to adopt the Silent Knight Motor—the Engine used by Daimler Mercedes, Panhard and Minerva

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CLEVELAND, OHIO
Branches: New York, Pittsburg, Atlanta, Minneapolis and San Francisco



THE RUTENBER MOTOR

Is responsible for the success of a large majority of the most prominent pleasure and commercial cars. They will bear your investigation before the purchase of any type of car. Literature upon request.

THE WESTERN MOTOR CO., Marion, Indiana

Large photogravure of the above cut for framing 14c in stamps.

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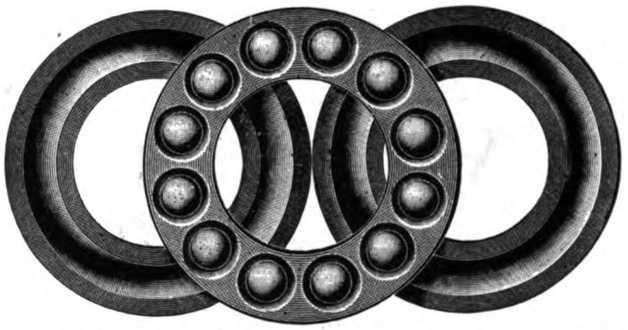
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START YOUR CAR FROM THE SEAT
ALWAYS READY AND POSITIVE

The AMERICAN STARTER is the Only Starter on the market that measures the amount of gas injected into the cylinders. You cannot "dope" the engine with the AMERICAN STARTER.

American Starter and Carburetor Mfg. Co.
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WE MAKE THE BEST



BANTAM ANTI-FRICTION CO., Bantam, Conn.

You Need

Speedo

IT'S GUARANTEED

Price $3.50
With Dearborner
High Power Models Upward

It will save you 20 per cent. in gasoline, increase power of motor 20 per cent. and is a positive preventive of carbonization.

How It Works—SPEEDO breaks up, under spray, each particle of gas after leaving carburetor, injecting additional air, automatically. Makes easy cold weather starting and is sold only Under Guarantee of Absolute Satisfaction. Ask your dealer.

INTERNATIONAL ACCESSORIES CORPORATION
Chicago Branch, FULTON-GRUHN CO., 1150 Michigan Blvd.

Price $20
Without Cylinder Attachments

The "Crankless" STARTER

By adding an injector and cylinder attachments the crankless starter becomes absolutely perfect—100% efficient. For 4 cylinders the extra attachment costs $10, for 6 cylinders, $15.

Guaranteed by our 40 years standing and reputation.

COX BRASS MFG. CO. Established 1872 **Albany, New York**

Start Your Car 25 Times for a Cent

INVINCIBLE STARTER

will start any four-cycle engine of four or six cylinders. Turn on the switch—that's all.

Price, NOW, Only $10

Fully guaranteed. Money back if not satisfied. Send your order today, stating make and model of your car. Illustrated Catalog Free.

INVINCIBLE STARTER CO., 748 Penobscot Bldg., Detroit, Mich.

THE GRINNELL
Gas Controller and Igniter

Price $30

Lights, dims and extinguishes all gas lamps on the car through a simple turn of the hand. Coupled to valve-stem of acetylene tank. Direct control. Always within easy reach.

Convenient—Safe—Dependable



Every car owner in your vicinity, Mr. Dealer, will be interested—it's up to you to show them—and sell them. Write for booklet and dealer discounts.

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GEARS

Bevel Differential
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$3,000,000 in plants affording the most superior facilities for fine work; also hardening and treating of the finished product. Most thorough inspection and testing system. Our own laboratory.

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Eliminate Noise in Your Car





Use Hyatt Roller Bearings



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K·D
The Motor With the Sliding Crescent Valve
KNIGHT-DAVIDSON
1896 — 1912

The CRESCENT valve of the K-D Motor, fitting around the stationary piston wall affords a larger port area than any other poppet or slide valve on the market. It is simpler and, consequently, better than any other valve construction known and is here offered to discriminating manufacturers, not as an experiment, but as a tried, tested and proved mechanical advance. The K-D motor is simple, silent, cools rapidly, has the simplest oiling system known, will not carbonize. Last and most important, will give on a given quantity of fuel more power, speed and endurance, unit for unit, than any other engine on any type of an automobile. We want to present some facts to interested manufacturers.

KNIGHT-DAVIDSON COMPANY, Boston, Mass.

KNIGHT-DAVIDSON

The Kinsey Manufacturing Company
TOLEDO, OHIO

Manufacturers of Auto Parts,
Kinwood Radiators, Fenders,
Kinwood Oilers, Gaskets,
Kinwood Steel Frames, Etc.

SPECIAL METAL STAMPINGS

KISSELKAR

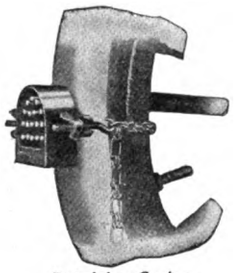


Every Inch a Car

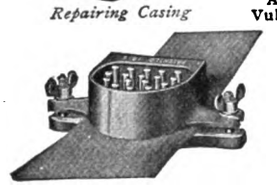
Extra liberal wheel base, extra big wheels and tires, full equipment, demountable rims, 4 speed transmission, 30, 40, 50 H. P., 4 cyl. models, $1,500, $1,850, $2,350; 6 cyl., 60 H. P., $3,000. Full line of trucks and delivery wagons. Write for 1912 portfolio.

Branches and Agencies everywhere

KISSEL MOTOR CAR CO., 159 Kissel Ave., Hartford, Wis.



Repairing Casing



TIRE CUTS ruin casings. They admit moisture to the carcass, cause the fabric to rot and weaken, grow larger—end in blowouts.

You can repair **CASINGS** and **INNER TUBES** anywhere in 15 minutes, better than a Repair Shop can do —and for *one cent.*

Universal Auto-Vulcanizer
Patented

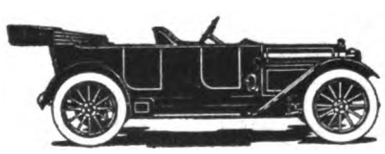
A practical vulcanizing outfit complete, with enough repair gum to make 40 patches. It weighs 3 pounds and can be carried in the tool box. **Simplest and most satisfactory device for eliminating tire troubles that has ever been devised.**

Absolutely automatic. Place the patch—attach the Vulcanizer—put in the gasoline—light it. No further attention required. In 15 minutes the job is done.

It *can't burn, scorch* or *injure* tube or casing. It *can't* get out of order. It *can't* fail to do its work. So simple, anyone can operate it. The Universal Auto-Vulcanizer saves its cost a *hundred times* over in trouble and expense.

Price Complete. **$4.00** Ready for Instant Use
Guaranteed Satisfactory or Money Refunded
ADAMSON MFG. COMPANY, East Palestine, Ohio

Mighty Michigan Forty



40-Horsepower Touring Car or Roadster, absolutely silent in operation. Cylinders 4¼ x 5¼-in. — 116-in. wheelbase—34 x 4-in. tires—demountable rims—nickel mountings—massive, straight line body—big, roomy seats—proved self-starter—everything. Price $1500. Guaranteed for life by the Michigan Buggy Company. 40-horsepower Roadster on the same chassis. Two smaller models. Catalog on request. (83)

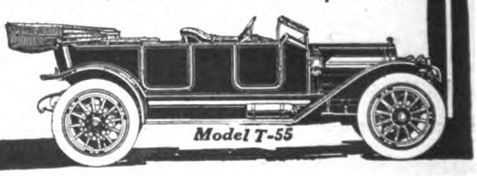
MICHIGAN BUGGY COMPANY, 188 Lay Blvd., Kalamazoo, Mich.

THIS Cutting CAR

Has more Horsepower and a longer Wheel Base than any other Four Cylinder Automobile in the World selling for this price **$1850**

Send for our Chart of Comparative Motor Car Values

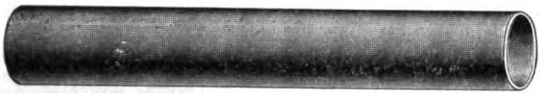
Clarke-Carter Automobile Company
Jackson, Mich.



Model T-55

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All sizes from 1 inch to 3 1-4 inches diameter cored and solid bars kept in stock for immediate shipment. Order by wire. We will ship by express.

Specify PARSONS' WHITE BRASS for main and crank pin bearings. CRAMP'S SPECIAL BEARING BRONZE for wrist pin bearings.

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PHILADELPHIA, PA.

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Automobile Frames and Special Stampings

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CLEVELAND, OHIO

Diamond Tires

We could build them cheaper
But We Won't.
We would build them better
But We Can't.

THE DIAMOND RUBBER CO.
AKRON, OHIO



DIAMOND CHAINS

are and have been the recognized quality standard for 20 years. Strong, accurate and durable. Let us cut your sprockets.

DIAMOND CHAIN & MFG. CO.
150 W. Georgia St. Indianapolis, Ind.
Capacity 8,000,000 feet per year.



Volkmar Auto Starter

Safe **Efficient**
Convenient **Economical**

A SPRING starter of Simple Perfection, ABSOLUTELY AUTOMATIC action and FULLY GUARANTEED.

Live Agents Wanted.

VOLKMAR AUTO STARTER COMPANY
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SPLITDORF MAGNETO

"Always There"

SPLITDORF ELECTRICAL CO.
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Magneto Bargains

$30.00 for a **$105.00** **6** cylinder
$20.00 for a **$93.00** **4** cylinder
$18.00 for a **$65.00** **2** cylinder
$16.00 for a **$60.00** **1** cylinder

Imported U. & H. High Tension Magnetos Less Than Import Cost

Circular and Price Lists Free

J. S. BRETZ COMPANY, 250 W. 54th Street, New York



Patent "Luxury" Folding Seats

Do you wish to make your car more comfortable by installing a pair of auxiliary seats? If so, have the best. Our seats are made in five styles. Send for catalogue.

HODGE & GRAVES CO.,
Amesbury, Mass.

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"THE MASTER CAR" FIFTEENTH YEAR

4 Cylinder 35 H. P. $4500; 6 Cylinder 50 H. P. $5500
(Completely Equipped)

The Fiat Agency Policy is One of Permanency

POUGHKEEPSIE **F.I.A.T.** NEW YORK

The Electric Car of Quality

THE COLONIAL

Big, roomy, 5-passenger, open or enclosed car of distinctive design and luxurious appointments. Equipped with self-starting device. It's the car with a thousand little conveniences—

and the price is $2700

DEALERS—Wire now for territory which is choice but going fast.

COLONIAL ELECTRIC CAR COMPANY
Detroit, Michigan

DURABLE MEANS DEPENDABLE DAYTON DELIVERY

DAYTON TRUCKS are made in 2, 3 and 5 ton models. They hold a world's record for durability, reliability and efficiency. Write for catalog.

DAYTON AUTO TRUCK CO. Dayton, Ohio

If You Need Motor Lamps

You Need This Catalog

We want you to write for the Solar Catalog before you decide on your motor lamps, for this is the most complete line of lamps on the market. Solar Lamps have been preferred by most motorists for the past fourteen years because of their brilliancy, their style, their strength and their several exclusive advantages—their special short focus lead glass lens mirror reflectors—the patented double ray light projection (in the Solarclipse), giving two distinct fields of light, for city and country use—the new black finish, the only such finish that's proof against heat and moisture—and other features that other lamps lack.

To fail to see Solars before you buy is to fail to include in your consideration the very finest lamps in existence. Solars are made for oil, electricity, gas and in combination, for pleasure cars, motor trucks, carriages, motor boats and airships. Write for catalog now—while you think of it. (136)

Kenosha, Wis. **BADGER BRASS MFG. CO.** New York City

SOLAR LAMPS

Drop Hammer Forgings

cost very little more than castings. They are vastly superior and less expensive in the end.

WE ARE SPECIALISTS
in producing
DROP HAMMER FORGINGS
from special analysis steel.

Send prints of parts you will need in
1913.

QUALITY AND SERVICE GUARANTEED

THE CONSOLIDATED MANUFACTURING COMPANY, Toledo, Ohio

Motor Car Manufacturers Since

1893

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1912

Occupying the newest and most modern automobile manufacturing plant in America.

HAYNES AUTOMOBILE COMPANY, Dept. T-8 Kokomo, Ind.

Abbott-Detroit

1912 MODELS

MODEL "44"

Seven Passenger, Fore-door Touring Car, fully equipped, less top, windshield and extra seats	$1800
Fore-door Demi-Tonneau, fully equipped, less top and windshield	1775
Fore-door Limousine, fully equipped	3000

MODEL "30"

Fore-door Touring Car, fully equipped, less top and windshield	$1350
Fore-door Roadster, fully equipped, less top and windshield	1275
Colonial Coupe, fully equipped	2150

ABBOTT MOTOR COMPANY
607 Waterloo Street Detroit, Michigan

SHAWMUT TIRES

SOLD EVERYWHERE **SHAWMUT TIRE CO., Boston, Mass.**

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Franklin "Little Six"

$2800

A new type of six—a small one.

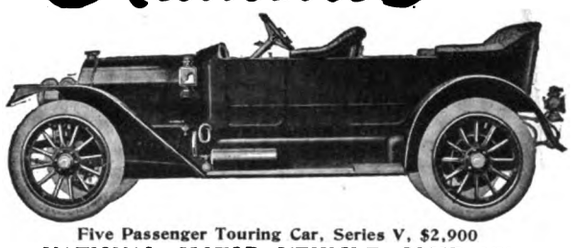
Some sixes weigh twice as much. No other six weighs so little and no other is so compact.

Motor only thirty-horse-power—good as sixty-horse-power for what a man wants—the car itself is so light.

FRANKLIN AUTOMOBILE COMPANY Syracuse N Y

Stock Champion International Champion

National 40



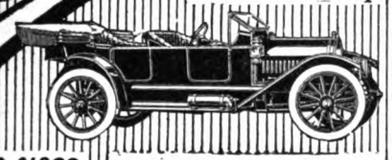
Five Passenger Touring Car, Series V, $2,900

NATIONAL MOTOR VEHICLE COMPANY

1007 E. 22nd Street Indianapolis, Ind.

Jackson

No hill too steep
No sand too deep



MODEL 52 $1800
" 45 $1650
" 32 $1100
" 26 $1100
" 28 $1000

JACKSON AUTOMOBILE CO.
1204 E. Main Street
JACKSON, MICHIGAN

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THE UNIVERSAL CAR

Its lightest—rightest—most economical—that's the reason we'll make seventy-five thousand of them this year. Prices $590 to $900. Agencies everywhere.

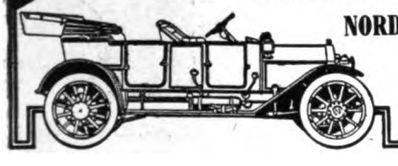
Ford Motor Company Detroit, Mich.

The Easiest Riding Car in the World

MARMON

A rational, logical car, made on one chassis—a body type for every requirement. Touring car, $2,750.

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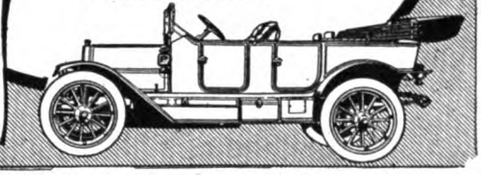
NORDYKE & MARMON CO.
(Established 1851)
Indianapolis, Indiana
Sixty Years of Successful Manufacturing

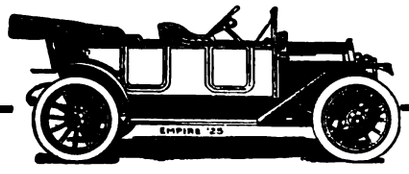
Speedwell

A Car with those Qualities that really count

THE SPEEDWELL MOTOR CAR CO.
DAYTON, OHIO.

Touring Car
7-Passenger
$2,900
Fully Equipped including Self-Starter





Empire Twenty-Five

"The Little Aristocrat"

This is the Big Brother of the Famous Empire Roadster and is a small edition of $5,000 cars.

Hence the price of $850 puts this car in a class by itself. Specifications prove the Empire 25 to be the most "aristocratic" little touring car in America. Write for details today.

THE EMPIRE AUTOMOBILE CO., 224 Massachusetts St., Indianapolis, U. S. A.

Hupmobile

Long-Stroke "32" Touring Car $900 F. O. B. Detroit

Motor 3¼ x 5½ inches; four cylinders; Bosch magneto; three speed sliding gears; tires 32 x 3½ inches; 106 inch wheelbase. Equipment includes windshield, gas headlights, generator, oil lamps, tools and tire repair kit.

Roadster body on same chassis and with same equipment, $900 F. O. B. Detroit.

20 H. P. Models

Runabout—$750
F. O. B. Detroit. Same power plant as World-Touring Car. Wheelbase, 86 inches. Equipment of top, windshield, gas lamps and generator, oil lamps, horn and tools.

Roadster—$850
F. O. B. Detroit. Same chassis and power plant as World-Touring Car. Wheelbase, 110 inches. Same equipment as Runabout, also highly finished steel box on rear deck for tools and accessories.

Coupe—$1100
F. O. B. Detroit. Same power plant as World-Touring Car. Wheelbase, 86 inches. Electric headlights, electric and oil side and tail lamps, folding dash seat for third person. Rear tires, 31 x 3½ inches. With 110 inch wheelbase, $1150.

HUPP MOTOR CAR CO., 1254 Milwaukee Ave., Detroit, Mich.

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JONES RECORDER

Gives time, speed and distance. Number of stops—length of each stop. Complete record of every movement or stop of vehicle marked on chart. Absolutely essential to all operators of motor trucks or delivery wagons.

The Jones Recorder consists of a strong brass casing, containing a clock work and flexible shaft from the drive wheel of the vehicle.

THE JONES SPEEDOMETER

Commercial Vehicle Department 1315 Canal Place, New York

Any Kind Every Kind Stock, or to Blue Print **Rims** Clincher Q. D. Demountable Channels

For Automobiles, Motor Trucks, Aeroplanes, Motorcycles, Bicycles.

We Also Make Axles and Hubs.

MOTT WHEEL WORKS, Utica, N. Y.

R. B. ABBOTT SALES CO., Sales Agents, Detroit

Best on Earth — Kantsamore

ESTABLISHED 1855

Phineas Jones & Company

305-313 Market Street, Newark. N. J.

Branch Factory: 12th Avenue and 55th Street, New York City

Automobile Wheels

For Pleasure Cars and Trucks

Repairing and truing old wheels a specialty. Experimental wheels a specialty. We furnish and apply any style demountable or detachable rim or tire.

Front Axle Yoke Bolts

You require the best bolts made—bolts manufactured from suitable analysis open hearth or nickel steel—bolts tough and strong and properly hardened for this vital duty.



Your inquiry for bolts ground to size, ready to slip into place, will bring surprisingly low prices—quality of work considered.

The Electric Welding Products Co.

Cleveland, Ohio

Champiou Spark Plugs

Special Desigus for Every Type of Motor Made

CATALOG MAILED ON REQUEST

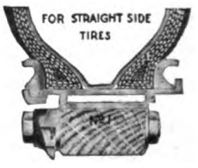
Champion Spark Plug Co.

TOLEDO, OHIO

Standard Universal Rims



fit any style or make of tires. The side rings are reversible, they curve outward on one side to fit a straight side tire, inward on the other to accommodate a clincher. Two turns of a nut unlocks the rim for demounting, two more turns locks the rim in place. Write for catalog 607, which explains fully.



THE UNITED RIM COMPANY, Akron, Ohio

AUTOMOBILE OWNERS AND TOURISTS

should break their journey and avail themselves of the excellent facilities afforded by the D. & C. Lake Lines, operating daily service between Detroit and Buffalo and Detroit and Cleveland.

Enjay the delights of the cool breezes from Lake Erie and resume your journey in the morning after a refreshing night's rest. Special attention given by this Company to the handling of automobiles. Rates quoted on application (state wheel base); Tanks of Automobiles must be emptied of gasoline before being shipped; three gallons of gasoline supplied free on arrival at destination.

Roads in this section of the country are in first class condition; new road now under construction between Detroit and Toledo. Tourists speak highly of the route between Buffalo and New York.

On your trip this summer bear in mind "The Waterway is The Only Way."

DETROIT & CLEVELAND NAVIGATION CO.,
General Offices, Detroit.



Soot and Carbon CAN'T collect on Reliance Spark Plugs, and impair their efficiency. The patented electrical action of the Reliance prevents it. Soot and carbon are destroyed before being deposited.

If you drive an automobile you want Reliance Plugs. If you build automobiles equip them with Reliance plugs and please the purchasers. You can't furnish better plugs.

JEFFERY-DEWITT CO.

65 Butler Avenue Detroit, Mich.

Largest Exclusive Spark Plug Manufacturers in the World.

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How Much Longer

The Car Agent asks the Manufacturer

Car Agent: When are you people going to give us some kind of a real signal in place of that out-of-date bulb-horn?

Manufacturer: That's hard to say. As soon as the prices come down within reach. Or the pressure from buyers becomes so strong that we have to.

Car Agent: The pressure is pretty strong—*right now*. And as far as prices are concerned what good is our claim that no expense has been spared to provide the *best*—of *everything*—if this affects the adoption of an efficient signal? Should not '*best*' apply to equipment as well as to construction?

Manufacturer: Well, you know there's a mighty big difference between the cost of a bulb-horn and a signal like, for instance, the Klaxon—and this is what you say most buyers insist upon. The bulb-horn we put on now costs us about an eighth of what the Klaxon would cost.

Car Agent: That's all right—as long as you can get away with it. But you can't do it much longer—motorists are getting too wise—they know too well what a farce the bulb-horn is. The brunt of the deal falls on us. Other makers supply the Klaxon. Customers know it. Right along, to make a sale we have to give them one, and take its cost out of our commission.

Manufacturer: Don't do it. Make them buy the Klaxon *themselves*. Tell them it's a *luxury*.

Car Agent: They know better. That's what we've been telling them for a couple of years. You can't argue with them any longer on that score. They know—as well as we do—that it's a *necessity*. Why as far as that is concerned—we have one on our demonstrating car. Have to. Simply cannot do without it. You can't make a good demonstration—you can't drive a car—and drive it *right*, unless you *do* have. Buyers know this. They see the Klaxon there—ask if it's regular equipment—and, well, it's mighty hard to explain to them why it isn't.

Manufacturer: Sell them the *car* then—on its merits. Make them *forget* the equipment.

Car Agent: That's all right to say—but nowadays it doesn't work. There are too many good cars whose agents *do* talk equipment—who *give* them the things we *charge* them for.

Manufacturer: Well, it probably won't be for long. Sooner or later we will come to it. We have been staving it off. But I guess we can't do it much longer. We will try it another year and see what happens. Then maybe we will put on a "buzzer" or something—to satisfy their protest against the bulb-horn.

Car Agent: If you think you can satisfy the average car buyer with anything less than the Klaxon, I believe you are mistaken. They know it too well. They know it's the only signal—and to try to hand them anything else would make it harder even than at present. Besides, it's a confession of cheapness which reflects on the car. We must give them the *best* or nothing at all.

26 *different makes of motor cars now carry the Klaxon in their regular equipment. The agents of many of the others supply it without charge to customers that emphatically insist.*



KLAXONET

Lovell-McConnell Mfg Company Newark, N.J., U.S.A.

KLAXON

"The Public Safety Signal"



KLAXON

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Studebaker

Flanders "20"

Suppose we deliver a "20" at your door tomorrow—

Touring time is here; and you feel the urge of it.

Telephone the Studebaker dealer and have a "20" sent out tomorrow.

It will cost you $800—or $885, if it's fully equipped.

And what will you get—will you get $800 worth?

Well, we don't know of a better $800 worth in the world.

We'd say that, even if you judged it only from the standpoint of size; and good looks; and workmanship; and material; and generous specifications.

But that isn't the main point.

The thing that ought to bring you to a decision to send for the "20" tomorrow is the certainty that you're not taking a chance.

It might be wise to take more time if the "20" were just a motor car.

But it's infinitely more than that — it's a Studebaker motor car.

Seventy-five thousand other owners have preceded you in the Studebaker 'testing out' process.

Sixty years of faithful performance have made the Studebaker word as good as gold.

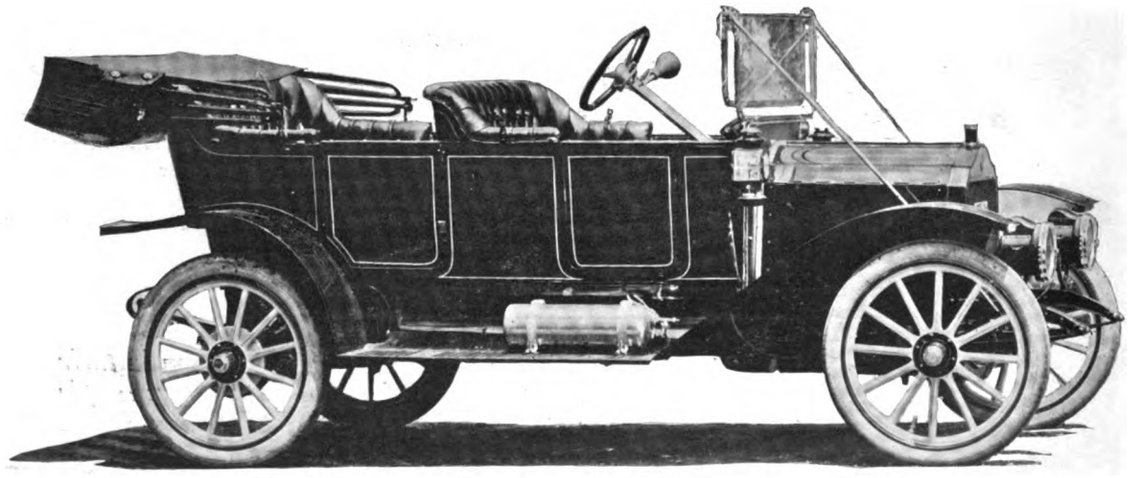
Enormous productive capacity and world-wide distribution make the price right.

Yield to that impulse to get a car at once.

You're made absolutely safe by that name Studebaker.

Telephone the Studebaker dealer.

Take the children with you when you get the first demonstration tomorrow.



Studebaker Flanders "20" Touring Car

$800 F. O. B. Detroit, standard Equipped.
Equipped as above, with Top, Windshield, Prest-O-Lite Tank and Speedometer, $885.

The Studebaker Corporation, Detroit, Michigan

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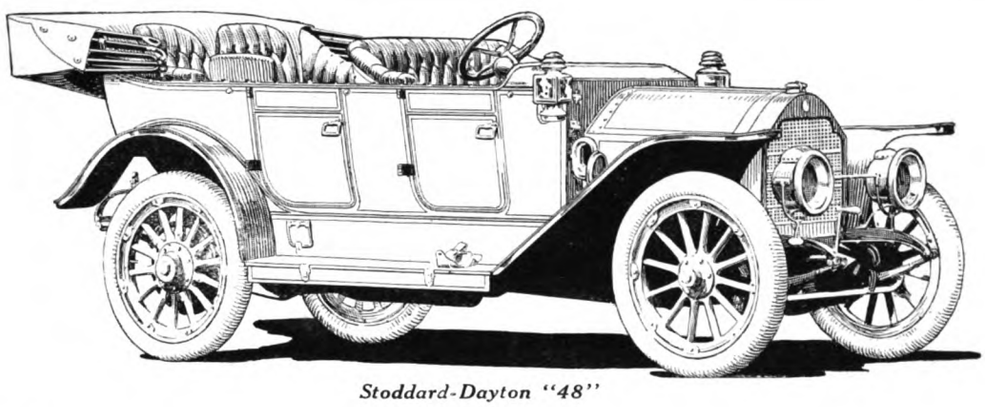
THE MOTOR WORLD

A Trade Paper Giving the World's Motor News

Vol. XXXII
No. 5

New York, July 25, 1912

Ten cents a copy
Two dollars a year



Stoddard-Dayton "48"

Stoddard-Dayton Automobiles
1913 Announcement

STODDARD-DAYTON AUTOMOBILES for 1913 will be known chiefly for their luxury, beauty and comfort. Four models, embodying refinements developed through nine years of successful production, are presented. They follow in general design, beauty of finish, completeness and excellence, those features which have always guaranteed to Stoddard-Dayton owners cars as durable, capable and satisfying as can be built. The Stoddard-Dayton "Knight," the only six-cylinder car built in America with the Silent Knight motor, the Stoddard-Dayton "48," "38," and "30" give a range in size, power and price which accommodates all desires.

We know that the 1913 Stoddard-Daytons offer extraordinary values in strictly quality cars, and that the distinct pride of ownership enjoyed by those who have driven Stoddard-Dayton cars will continue with increased measure.

1913 Specifications

Stoddard-Dayton "Knight"—$5000

The highest achievement of the science of automobile engineering. Seven passenger touring car; six cylinders, 70 hp; left-hand drive, center control; wheelbase 133 inches; tires 36x5; Q. D. demountable rims; selective transmission; electric lights and horn; Hartford shock absorbers; mohair top and boot, storm curtains; rain-vision windshield; speedometer; seat covers; tools, jack, trunk rack; tire holders; color and upholstery choices. Knight Compartment Roadster, $4900; Limousine $6250.

Stoddard-Dayton "38"—$1850

A large, powerful, quiet car, of a renowned family, at a moderate price. Five passenger touring car; four cylinder, long stroke motor, cast en bloc, 38 hp; wheelbase 114 inches; tires 36x4; Q. D. demountable rims, selective transmission; gas head lamps and tank, oil side and rear lamps; mohair top and boot, storm curtains; windshield; jack, tools; color choices. Compartment Roadster $1750; Coupé, inside drive, $2350; Limousine or Landaulet $2750.

Stoddard-Dayton "48"—$2800

The car with the famous valve-in-head flexible and quiet motor. Seven passenger touring car; four cylinders, 48 hp; wheelbase 123 inches; tires 36x4½; Q. D. demountable rims; selective transmission; gas head lamps and tank; combination oil and electric side and rear lamps; Hartford shock absorbers; mohair top and boot, storm curtains; rain vision windshield; jack, tools; color choices. Compartment Roadster $2700; Limousine $3900.

Stoddard-Dayton "30"—$1450

A "smaller" Stoddard-Dayton with the lines, appearance and careful finish of the larger cars. Five passenger touring car, four cylinder, long stroke motor, cast en bloc, 30 hp; wheelbase 112 inches; tires 34x4; Q. D. rims; selective transmission; gas head lamps and tank, oil side and rear lamps; all metal trimmings nickel plated; mohair top and boot, storm curtains; jack, tools, color choices. Compartment Roadster $1350.

DELIVERIES NOW *Dealers everywhere are prepared to make deliveries of the touring car and roadster models at once. We will be glad to send you the Advance Catalog for 1913. Write for it.*

UNITED STATES MOTOR COMPANY

Stoddard-Dayton Division

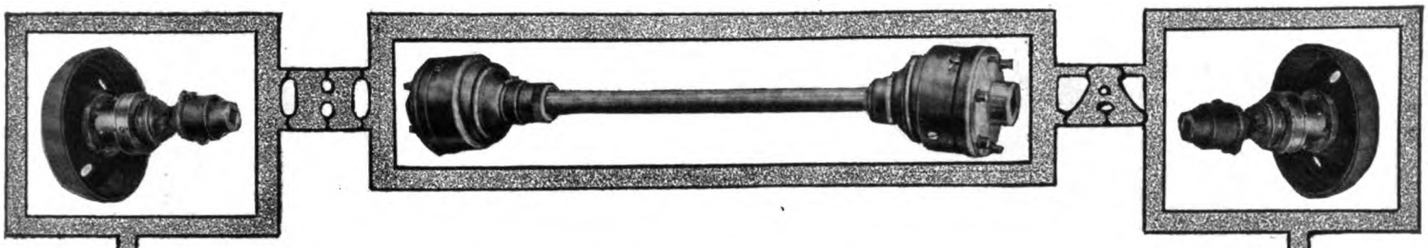
1 West 61st Street, at Broadway New York

Published Weekly by The Motor World Publishing Company, 1600 Broadway, New York

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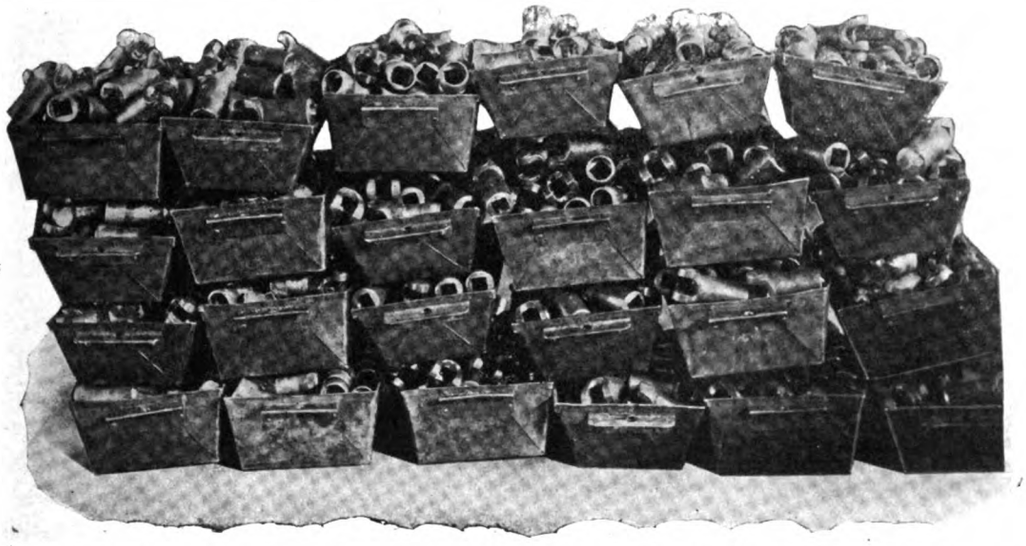


F-400 Slip Hubs (30% Carbon Steel)

Another group showing part of an order from one of the best known car concerns in the country—all now assembled and delivered as per time clause, as usual.

Nowhere, in the field in which we operate, is there a maker of universal joints and cone clutches, that can "promise and perform" along lines upon which we operate.

Here we follow your specifications, beginning with material of your selection—heat treatment according to your formula, design as per your laid down lines, forging, machining and finishing subject to your smallest requirement. And then F. O. B. Hartford on date demanded. Not sometimes, but always.



In fact, our shops are part o your plant for the time being, and from them come your products, flawless, and correct in every detail.

Scores of pleasure car and truck builders—all representative in the field—will attest to the correctness of this statement.

We stand ready to become a temporary part of your organization—from our engineering department on down to the raw material department.

J. S. BRETZ CO.. New York, Detroit, Sole Selling Agents.

CONE CLUTCHES

HARTFORD AUTO PARTS CO.
HARTFORD, CONN.

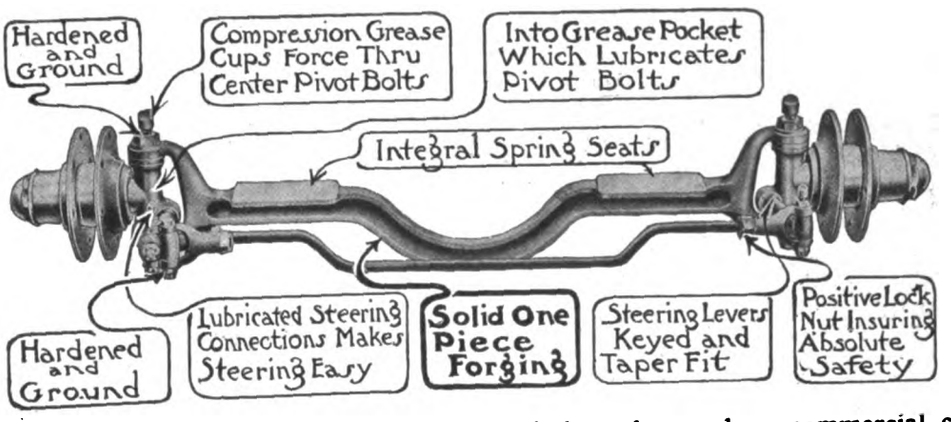
UNIVERSAL JOINTS

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EXPERIENCE - SHELDON - RIGHT DESIGN
FACILITIES — AXLES — RIGHT STEEL

"Made in the Largest Axle Factory in the World"

Axle Talk—No. XII



Our plant turns out seventy-five per cent of the axles used on commercial cars, and this fact alone presupposes quality production beginning with design and material and ending with service.

The truck axle has a pretty hard time of it. It's relative work as compared with a pleasure car axle, being in the same ratio as that of a heavy dray horse as compared with the pacer in a light rig.

Load on a truck means more direct stress, corresponding road shock and violent side thrust, while solid tires still further add to the trials of the commercial axle.

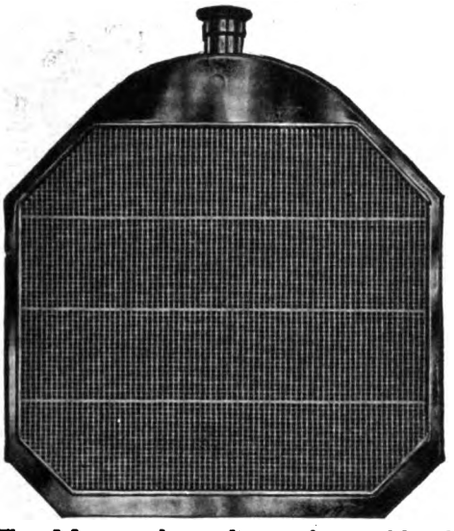
Pound for pound the truck axle ought to be better built and stronger than pleasure car design—it remains that some of them don't measure up to this standard.

There is a certain well defined reason for SHELDON supremacy in the commercial car field—also a reason accounting for the fact that pound for pound SHELDON pleasure car axles are in the same class with their big brothers. Quality is that reason.

SHELDON AXLE COMPANY, Wilkes-Barre, Pa.

CHICAGO OFFICE—68 East 12th St. DETROIT OFFICE—1215 Woodward Ave.

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The Mayo - the radiator thoroughbred

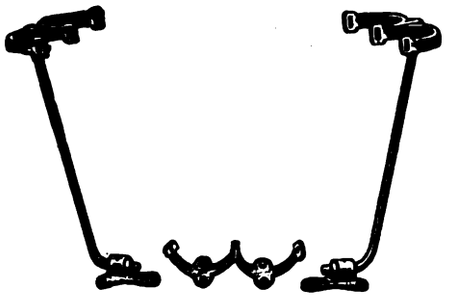
¶ Experts who designed MAYO—The Radiator Thoroughbred, didn't infringe upon the ideas of any other manufacturer, but instituted their own and produced the most efficient automobile radiator known.

¶ It required study and years of experience to produce the MAYO—we're satisfied that it's the best. Are you.

Mayo Radiator Company
NEW HAVEN, CONNECTICUT

The Largest Automobile Supply House in America
FIFTEEN STORES IN THE UNITED STATES

"Torpedo" Tire and Demountable Rim Holders



Designed especially for use on Torpedo body or Fore-door cars. Set consists of two strong arms firmly bolted to running board and permitting of sufficient adjustment to accommodate two tires or demountable rims, of standard sizes, 4 inch or smaller. Made of solid Brass and guaranteed to give perfect satisfaction.

Finish: Furnished in Hard Rubber Black Enamel finish, and full Polished Brass.

	Brass	Black
Price, complete with Straps...	$4.00	$3.00

A dozen other styles and sizes in stock. See catalog.

Our 1912 Catalog, which is held as a book of reference by manufacturers, dealers and automobile owners, will be mailed on request. Circulation limited to 100,000 copies.

Chas. E. Miller
MANUFACTURER, JOBBER, EXPORTER AND IMPORTER

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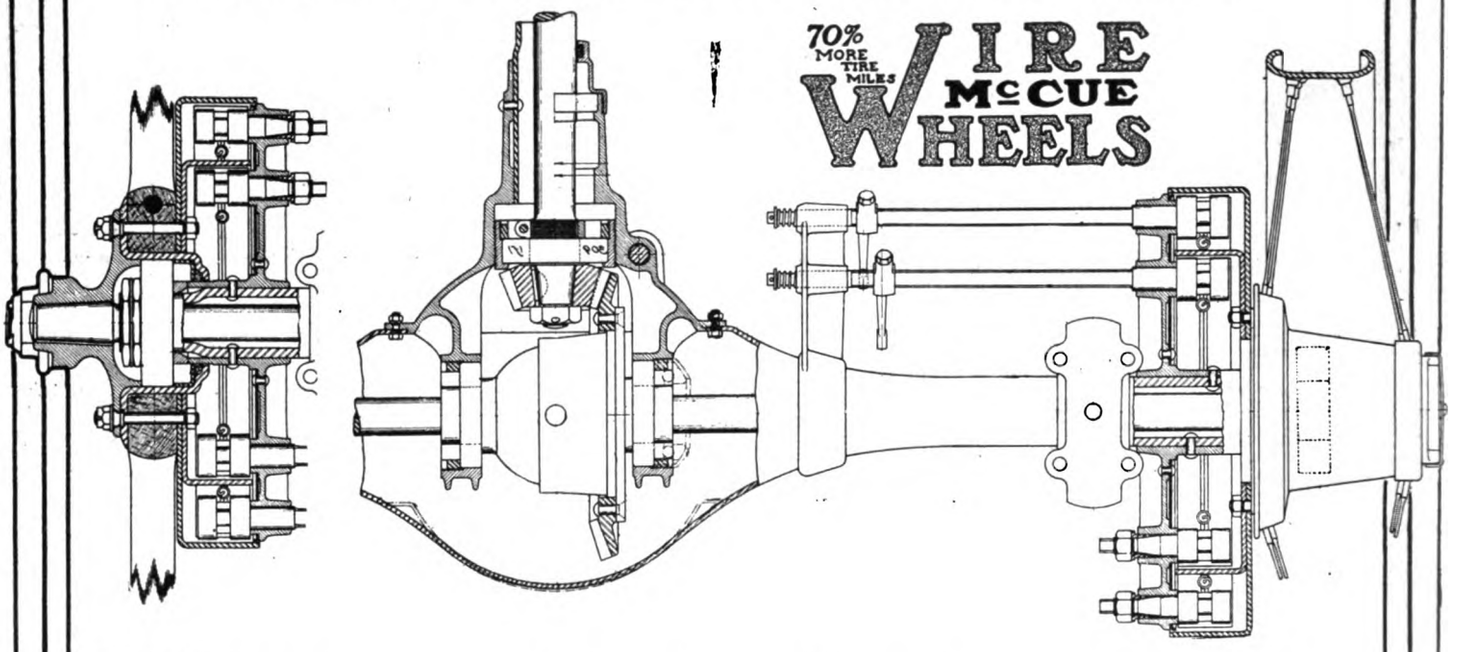
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McCue Wire Wheels and McCue Axles

This combination means the most advanced motor car design and construction that progressive manufacturers can select.

The superior of McCue axles does not exist.

McCue axles are designed especially for cars requiring rigid yet light construction. The overload allowance is extremely liberal and the additional factor of safety is extremely high. The driving shafts are so designed as to divide the carrying and slewing load with the center bearing. All bearings are extremely large and of the highest grade possible to obtain. Special attention is given to the mounting of these bearings and in the calculation of the bearing size in relation to weight, the question of the shaft diameters is carefully considered. As a result, we have never had a broken differential housing or axle tube, even though many of our axles have been used on cars weighing 50 per cent more than the capacity for which the axles were designed.



Wire wheels, of course, are certain to be standard equipment on many American cars within a very short time. They have come into their own abroad and are fast being taken up by the progressive American manufacturers.

Wire wheels are acquiring their prestige solely from intrinsic merit, for any one improvement which will enable car owners to realize practically *70 per cent more tire wear than without the improvement is bound to become standard.

This is what wire wheels do.

They are the greatest conserver of tires brought out since the beginning of motor cars.

Not only do wire wheels mean economy to car owners but they mean more car owners and more car sales for dealers and manufacturers.

The McCue Company is a pioneer in wire wheel construction in this country.

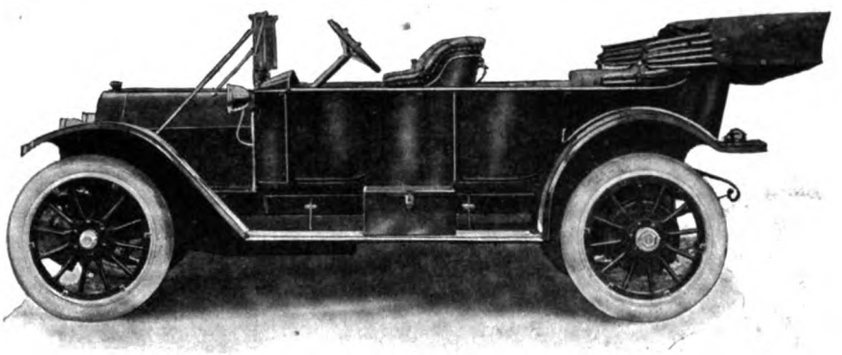
McCue axles will admit of the use of either wire or wooden wheels on the same spindle.

* In a SIX MONTHS TEST conducted by the ENGLISH DAIMLER Company, wire wheels showed an ACTUAL tire SAVING of 68.75 PER CENT.

THE McCUE COMPANY, Buffalo, New York

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Pullman



BACK of every Pullman car and working hand in glove with Pullman agents is the most perfected sales making organization in the industry.

Long ago the Pullman Company realized that the average Dealer doing business on the usual discount was at a disadvantage. His net earning on each car was none too large and each year the buying public demand more and more for their money.

The Pullman Company proceeded to apply the remedy, there was but one answer.

Reduce the Agent's Overhead Selling Expense

The present honestly built automobile cannot be overpriced—competition will not allow it—likewise the manufacturer who has already "gone the limit" cannot allow the Dealer a larger discount.

We anticipated this condition with the result that Pullman agents always have a tremendous advantage over competition.

Send for "Blue Print" of our "Sales Making Machinery"—learn more about our modernized sales methods. We spend thousands of dollars in locating your prospective purchaser in advance—we get you in touch—our selling plan is unique and will be mailed on request.

Every Pullman a Real Leader for 1913. All Fully Equipped

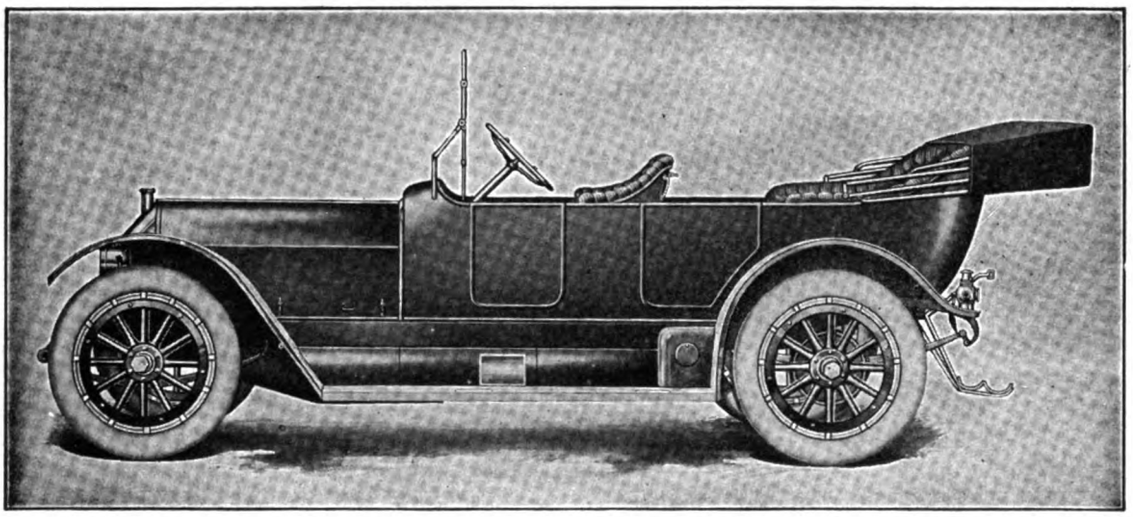
4-36	4-44	6-66
$1675	$2150	$2750

PULLMAN MOTOR CAR CO. — YORK, PA.

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Knox

Little Six—Model 46



The Car They Are All Talking About

Embodies the most advanced American and European ideas of approved design and construction.

A distinctive car of unusual power, quietness, comfort and style.

"It's the Car You've Been Waiting For"

6-cylinder motor, 4⅜" bore x 5½" stroke, A. L. A. M. rating 46 H. P.

130" wheel-base, 37 x 5" tires.

Handsome V-shaped radiator.

Silent chain-driven cam and magneto shafts.

Option on right or lefthand steering control.

Exceptional quietness in operation.

Attractive straight line body designs with concealed locks and hinges.

Clean running boards.

Self-starter on motor.

Dynamo lighting system.

Unequaled riding qualities.

Economical in operation and upkeep expense.

Beautiful appointment and finish in optional colors.

Price with Standard Equipment on all Open Type Bodies.....$4350
Price with Standard Equipment on all Limousine Type Bodies.....$5350

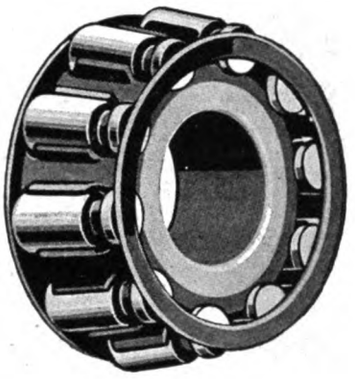
The Car That Comes Nearest to the Ideal You've Cherished So Long

Send for Advance Folder and arrange for an early demonstration.

KNOX AUTOMOBILE COMPANY, Springfield, Mass.

New York — BRANCHES — Chicago

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SPLITTING Hairs at the Timken Plant

It is literally necessary to split hairs to illustrate the extreme accuracy of the manufacture of Timken Roller Bearings.

An accuracy and care that came after Timken Bearings had won their way on the sheer merits of their unique principles of design alone.

TIMKEN
TAPERED ROLLER BEARINGS
are made with as much care as a watch

Take the gauging of the rollers for instance. Every roller in a Timken Bearing must be just the size of every other roller.

It would never do to trust the gauging of the rollers to human hands. Human liability to err is too great. The mechanical perfection of Timken Bearings is a matter of too much pride with us.

So we designed and built machines that take the rollers after they have been hardened and ground to the limit of human accuracy and sort them into lots in which every roller is the exact size of every other roller.

The machines do not err—they do not depend on human eyesight or judgment.

They distribute the rollers with unerring accuracy to different containers. The separation of the sizes is purely mechanical, and electrical. Electric contact decides which container each roller shall enter.

When the gauging is finished each container holds rollers of the same identical size. The containers are sealed till the workman assembles his bearings. Then he knows positively that every roller is right.

This is just one example of the care in making that assures you not only the bearing with all the correct principles of design, but the bearing that is built with the utmost accuracy.

This is one of the reasons why Timken Roller Bearings are giving such satisfactory service in the cars of the great majority of American pleasure and commercial car builders.

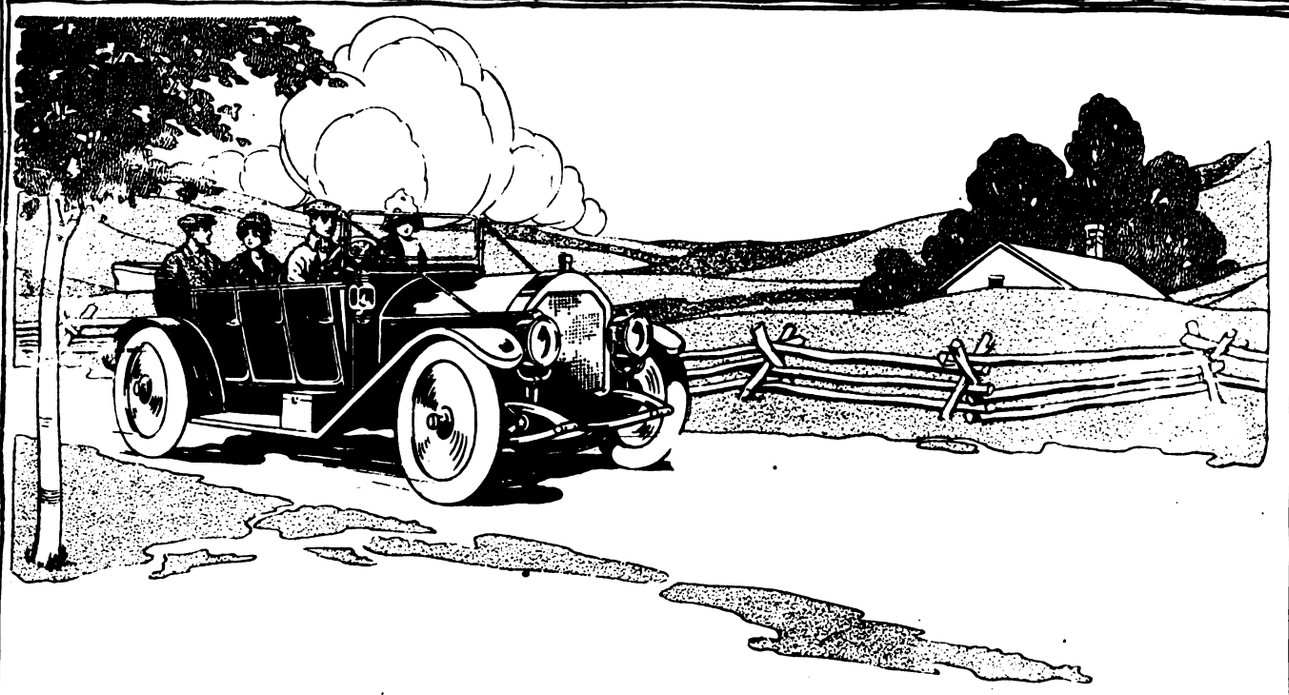
The list of Timken Users names nearly every good car that you know. Printed in a booklet called "The Companies Timken Keeps." Send for a copy today.

The Timken Roller Bearing Company
Canton, Ohio, U. S. A.

The only axle manufacturer licensed to make automobile axles equipped with Timken Roller Bearings is the Timken-Detroit Axle Company

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Motor in Comfort with the Truffault-Hartford Shock Absorber

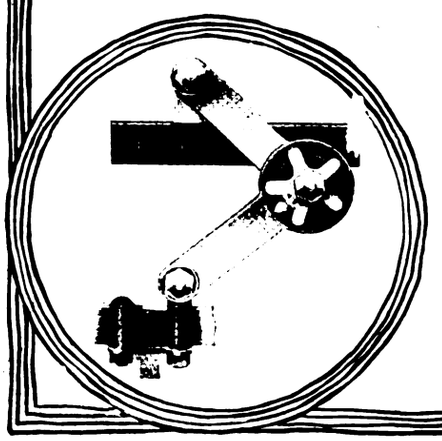
COMFORT has the call these days. Every car builder seeks for it; every car owner demands it. The pleasure of motoring is heavily discounted if not attended by real, solid comfort.

Jolt and jar are ticketed to oblivion as soon as a car is fitted with the

Truffault-Hartford SHOCK ABSORBER

and Comfort is king.

Then rough roads cause no fear for "every road's a boulevard."



Hartford Suspension Co.

Factory: 164 Bay Street, Jersey City, N. J.

EDW. V. HARTFORD, President

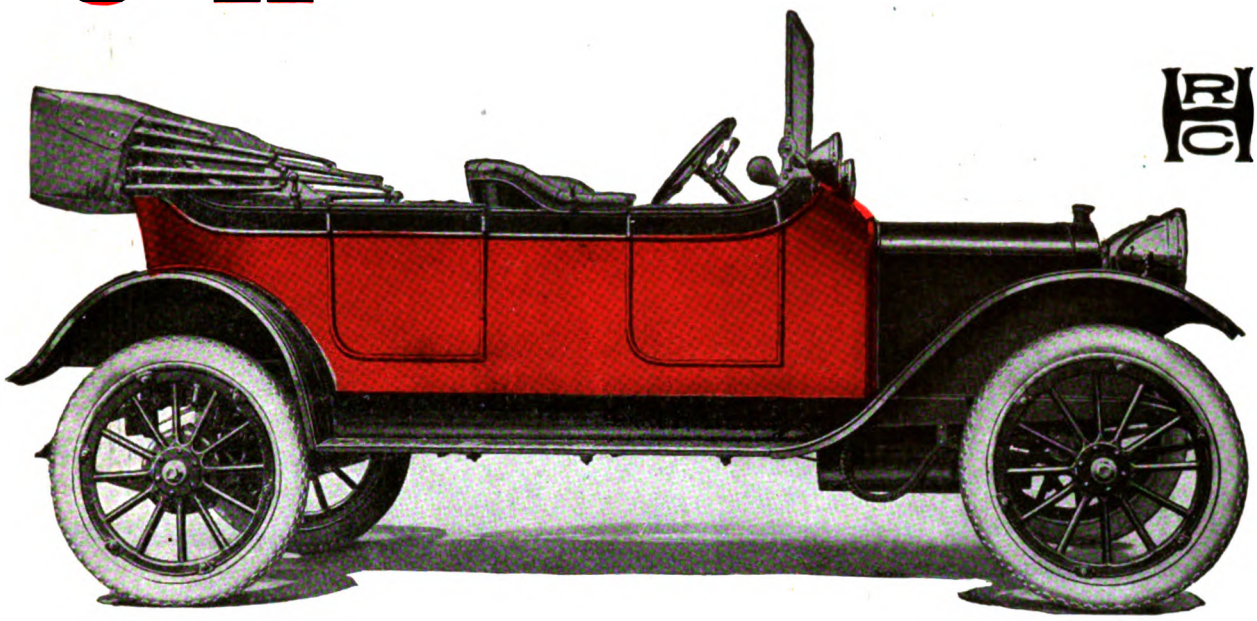
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ASBURY PARK—Ocean and Third Avenues
BRETTON WOODS, N. H.—Bretton Woods Garage

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R-C-H "Twenty-Five"

$900
f. o. b. Detroit



The Car

WHEELBASE—110 inches.

MOTOR—Long-stroke; 4 cylinders cast en bloc; 3¼ inch bore, 5-inch stroke. Two-bearing crank shaft. Timing gears and valves enclosed. Three-point suspension.

STEERING—Left Side. Irreversible worm gear, 16-inch steering wheel. Throttle control on steering column.

CONTROL—Center Lever operated through H-plate integral with universal joint housing just below. Hand-lever emergency brake at driver's right. Foot accelerator in connection with hand throttle.

SPRINGS—Front, semi-elliptic; rear, full elliptic and mounted on swivel seats.

FRAME—Pressed steel channel.

AXLES—Front, I-beam, drop-forged; rear, semi-floating type.

TRANSMISSION—3 speeds forward and reverse; sliding gear, selective type.

CONSTRUCTION—Drop-forgings wherever practicable; chrome nickel steel used throughout all shafts and gears in the transmission and rear axle; high carbon manganese steel in all parts requiring special stiffness.

BODY—Full 5-passenger English type; extra wide seats.

The Equipment

Non-skid tires, 32x3½.
12-inch Hall Bullet electric head lights with double parabolic lens.
6-inch Hall Bullet electric side lights with parabolic lens.
Exide 100 Ampere Hour Battery.
Bosch Magneto.
Warner Auto-Meter.
Demountable rims.
Extra rim and holders.
Tally-ho horn.
Jiffy curtains—up or down instantaneously.
Top and Top cover.
Windshield.
Rear view mirror.
Tool-kit, Jack, Tire Repair Kit, Pump.
Robe Rail.

THE car you handle is either an asset or a liability in your business.

On every automobile row this condition is vividly illustrated. You'll hear: "Brown is handling the ——— car and making a lot of money." And a little further on: "Smith represents the ———, but he isn't doing much."

The one dealer is prosperous; the other, on the ragged edge of failure. One is handling a car that appeals to the public; the other, a car that will not stand the acid test of public criticism.

The R-C-H appeals to a wider range of buyers than any other car on the market today.

The man who would ordinarily buy the lowest priced car he could find is so attracted by the wonderful value in the R-C-H that he is easily induced to spend a little more for a great deal better car. And the man who would ordinarily pay six or eight hundred dollars more, finds in the R-C-H everything essential to his motoring enjoyment and satisfaction. So he keeps the difference in his own pocket.

Any dealer who reads the specifications and equipment of the R-C-H, and considers the demands of his own clientele, knows these facts to be true.

From such dealers we invite prompt correspondence regarding open territory.

R-C-H CORPORATION, 104 Lycaste Street, Detroit, Michigan

Branches — ATLANTA, 548 Peachtree St.; BOSTON, 563 Boylston St.; BUFFALO, 1225 Main St.; CHICAGO, 2021 Michigan Ave.; CLEVELAND, 2122 Euclid Ave.; DENVER, 1520 Broadway; DETROIT, Jefferson Ave. and Lycaste St.; KANSAS CITY, 3501 Main St.; LOS ANGELES, 1242 South Flower St.; MINNEAPOLIS, 1206 Hennepin Ave.; NEW YORK, 1989 Broadway; PHILADELPHIA, 330 North Broad St.; SAN FRANCISCO, 819-835 Ellis Ave.; WALKERVILLE, ONT., CANADA.

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One Look Tells Everything

The JEFFERY-DEWITT CO. DETROIT, MICH. Visible Spark Plug lays bare all ignition troubles

The "visible gap" is an open "window" giving you a full view of the internal workings of your spark plug.

If the spark is seen jumping the gap, look for your trouble between the gap and sparking point.

If there is no spark in the gap, your trouble is behind the plug—in Magneto, or batteries, or coil, or wiring.

But for the "visible gap" it would take you many precious minutes —often hours—to locate the seat of trouble.



$1.00 Buys this great new Spark Plug

Indicates in which direction trouble lies.
Facilitates timing of engine.
Intensifies spark in cylinders.
Consumes only minimum current.
Gap adjustable—can be closed entirely.
By widening gap plug cleans itself.
Permits regulating spark for any cylinder.
Costs same as any good plug—$1.00.

Dealers will find J. D. Visible in greatest demand

Visible Idea Worked Out Perfectly for the First Time

The "visible gap" feature, so far as being incorporated in a plug, has always seemed as far away as perpetual motion. The visible feature has been marketed in a separate device for years, but this is the only plug in which this important visible feature is actually embodied.

It is simple. Merely a hole in the porcelain and a spiral action to regulate width of the gap in the central electrode which carries the current.

The hole in no way lessens the strength of the plug, and the current in jumping the "visible gap" loses none of its efficiency. On the other hand it intensifies the spark at the gap in the cylinder.

Additional prestige is lent the J. D. Visible Spark Plug by the fact that it is being introduced by the largest manufacturers of spark plugs in the world. We are exclusively manufacturers of spark plugs; we make millions of them each year.

The J. D. Spark Plug was a famous plug before it was improved by the visible feature. It combines finest workmanship, best materials and simplest designs.

Every part of this plug is made in our factory—even the porcelain being produced in our own potteries from clays and other ingredients imported from Europe.

This unequivocal guarantee goes with all our spark plugs:

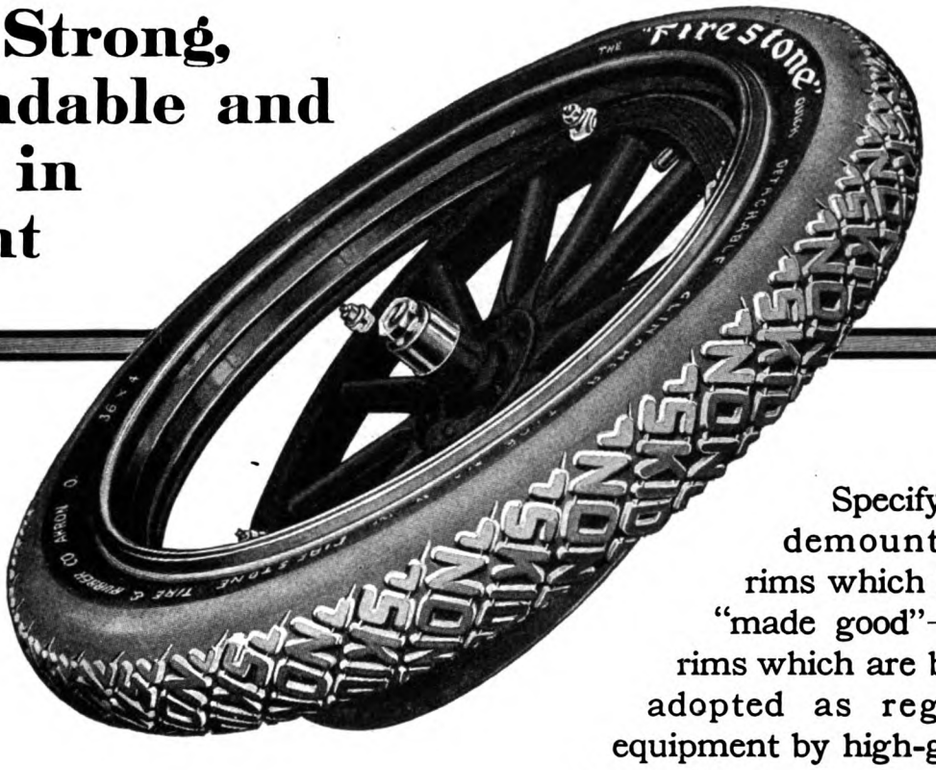
"Your money back or a new plug if you are not satisfied."

If your dealer hasn't the J. D. Visible yet, send your money direct to us for a set, specifying size wanted and make of car, and we will ship them postpaid. Remember, the J. D. Visible Plug is $1.00. Our literature on ignition free for the asking.

JEFFERY-DEWITT COMPANY, 565 Butler Ave., Detroit, Mich.

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Sure, Strong, Dependable and Light in Weight



Specify the demountable rims which have "made good"—the rims which are being adopted as regular equipment by high-grade car builders. Demand the rims which alone have passed experiment to accomplishment.

Firestone

Quick-Detachable

Demountable Rims

For Tires of All Standard Types

Their unbroken, "no split" base makes them moisture-proof. Bearing support is continuous. No wedges to force them out of true. Mechanism is simple—no delicate parts to get out of adjustment or rust together. A wrench removes the rim—a screw-driver alone is needed to remove tire, whether rim is on or off wheel.

Designed and built by the world's greatest ***tire makers,*** they never fail to fulfill the tire user's expectation.

Service-Wise users demand, Trade-Wise Dealers Recommend Firestone Rims.

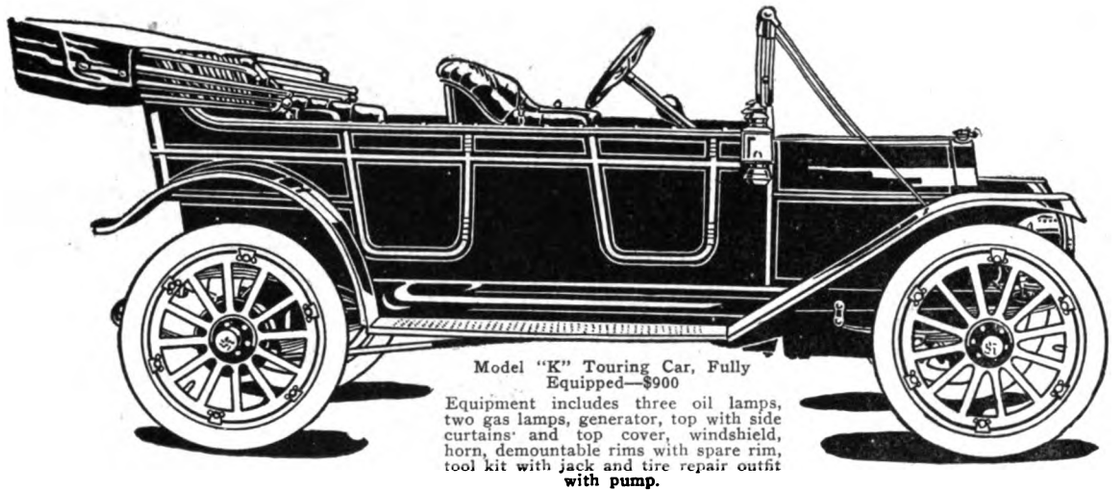
The Firestone Tire & Rubber Co.

"America's Largest Exclusive Tire & Rim Makers"

Akron, Ohio - - All Principal Cities

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K-R-I-T



Model "K" Touring Car, Fully Equipped—$900

Equipment includes three oil lamps, two gas lamps, generator, top with side curtains and top cover, windshield, horn, demountable rims with spare rim, tool kit with jack and tire repair outfit with pump.

The K-R-I-T is always a new car

One of the main elements of the extraordinary K-r-i-t value is the fact that the K-r-i-t is always a new car.

We employ an efficient corps of engineers and designers to devise improvements and refinements.

We install these improvements and refinements as rapidly as our engineers develop them, instead of holding them back for introduction on the next year's model.

So the K-r-i-t owner, at the beginning of a so-called "new season," as at all other times, finds himself with a car in which the latest practical ideas have already been incorporated.

The K-r-i-t car—every K-r-i-t car—has been brought up to the current moment in the motor car industry. We announce no sensational new model because every K-r-i-t car is new.

This policy is as old as the Krit Company.

We adopted it at the outset because we believe the buyer is entitled to the most modern in design, construction, or progress—no matter when he purchases his car.

Because of this policy, we make no "new season" announcements; and will make none this year.

And because of this policy, the purchaser of any K-r-i-t, at any time, is assured of getting a car that embodies the latest and best in engineering practice and in design.

Where the K-r-i-t gets its extraordinary power, extreme durability and long life

The K-r-i-t's reputation for staunchness and extreme durability is not confined to a few isolated communities, as you probably have learned.

It is as wide as the nation; and the rougher the country, the more difficult the roads—the more firmly the K-r-i-t is established as the medium-priced car that has made good.

The chief of the reasons for this is, of course, the structural quality of the car.

But back of this, and overshadowing in importance every other consideration, lies the fact that every part essential to smooth running, long life, economy and comfort, is produced by and within the K-r-i-t organization.

In other words, the K-r-i-t at $900 is a manufactured car in a sense as binding and literal as the term implies when applied to the $4000 or $5000 car.

You see how this process of manufacturing, instead of buying parts ready-made and assembling them, saves money for the manufacturer.

And the saving, in this instance—in the shape of better materials, more careful workmanship, better operative qualities—goes into the K-r-i-t and makes it a vastly better value than the average $900 car.

We not only design the motor—we make it; cast the cylinders in one piece to give rigidity and preserve alignment; equip it will ball bearings and with connecting rod bearings 50 per cent larger than usual, to promote smooth running, silence and the greater development of power.

We make the clutch of multiple discs—a clutch that holds, and holds, and holds in sand and mud and on the hills; and yet starts the car as smoothly and easily as an electric glides away.

We make the transmission and rear axle, cut the gears from chrome nickel steel—the hardest and costliest metal known—and mount them on ball bearings.

We drop forge the front axle, thus assuring strength and stability in a most important member.

We make the transmission drive shaft of chrome vanadium steel, and specially heat-treat it for toughness and strength.

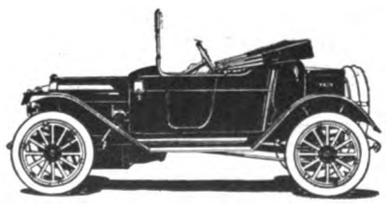
Turning to the factor of comfort, you find the touring car amply roomy for five grown persons—and equipped with full elliptic rear springs, another unusual feature for $900 to $1000 cars.

At almost every point throughout the K-r-i-t you encounter a value fact that you have not found in other cars of the K-r-i-t price.

To be sure, you may succeed in getting one, or even several, of the K-r-i-t features in some other car of equal price.

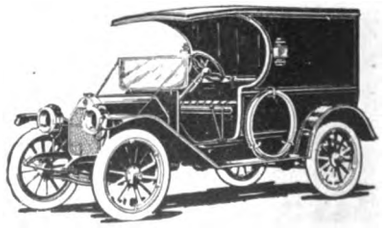
But you can't get them all in any car save the K-r-i-t.

Confirm this by a visit to the nearest K-r-i-t dealer; or write for the catalog.



Model "KR" Roadster, Completely Equipped—$900

This car was introduced last September; and the demand which it immediately developed was so great that we are not yet abreast of our orders.



Model "KD" Delivery Car, Completely Equipped—$900

KRIT MOTOR CAR COMPANY

Mt. Elliott Ave., DETROIT, MICH.

DEALERS—Please Address

GEO. A. CRITTENDEN, Sales Manager.

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"The Horn that's Made for the Discriminating"

TUTO HORN

THE TWO TONE HORN

Not Paralyzing to Car Occupants.

THE loud abrupt warning signal is necessary on the motor car for limited use, such as emergencies.

¶ To forestall these emergencies, a low abrupt signal also is necessary.

¶ Ordinarily this means the retention of the inadequate bulb horn for regular service and the supplementing of it with a second device for producing the loud note.

¶ If the loud note only is employed for all of the signalling of the car, it is extremely objectionable, both to the car occupants and to those outside.

¶ Modern adverse legislation is ample proof that the indiscriminate use of this loud warning note is objectionable to the majority of the people.

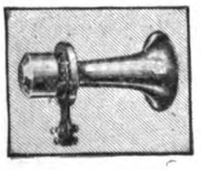
¶ Car occupants, especially women, will not put up with the unnerving, paralyzing note of the inflexible loud warning signal.

¶ The demand is for a low note in addition to the loud note, and before the advent of the TUTO Horn it was necessary to retain the inefficient bulb horn for this milder signal, requiring the confusion and rapid action of going from a bulb to a button when an emergency arises.

¶ The TUTO Horn does all of the signalling of the car by having a low abrupt note which is found to be effective fully 90% of the time, also a loud emergency note which can be produced instantly by a mere increase of the pressure on the same button that is used for the milder signal.

¶ There is no duplicate of accessories and the TUTO is so designed that it can be mounted permanently so as to operate without interruption or attention, as long as the rest of the car.

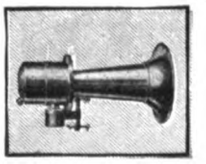
¶ The TUTO Horn is best for standard equipment as it is the only device which does all of the signalling and in a simple and safe manner.



The Dean Electric Co.

260 Taylor Avenue, Elyria, Ohio

"Look for Dean where Quality's seen"



TUTO Horn, $25.00

TUTO-ETTE $17.50

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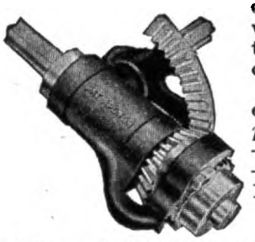
A Perfect Starter At Last!

Energetic Dealers Wanted

A rare business opportunity. Live dealers throughout the entire world wanted to represent us and to install the National Starter

The First Perfect Mechanical Starter

It has always been said that if a *perfect* starter could be built—a *dependable* starter—one that would start the engine from the seat and forever do away with dangerous cranking—that such a starter would revolutionize motoring—that it would add the final touch of perfection to the automobile.



—and now, after years of experimenting, comes the first *perfect* mechanical engine starter—the NATIONAL STARTER—the *only* starter that is actually 100% efficient.

Works *every* time.

No batteries—no tanks—no wiring—no piping—no springs. Nothing but simple ball-bearing gearing.

Dealers in automobiles and accessories, and garage owners will instantly recognize the tremendous business possibilities of this new starter.

The Principle of the National

The National is built on a patented principle.

It is purely mechanical.

A simple pressure of the foot and the engine turns over—just like cranking.

The powerful leverage which is obtained through gear reduction turns the engine over easily—*so easily that you can start on the magneto just as readily as on the batteries.*

The National works equally well in hot or cold weather. It is *not* dependent upon acetylene gas, compressed air, gasoline, electricity or springs. It develops its entire energy through the slight pressure of your foot on the dash pedal—like a clutch. In case of back-fire the National automatically disengages.

We have subjected the National to the severest tests. We have tried it out in all sorts of weather and on all sorts of cars. We made it *prove* its merits.

And now we back every National with an ironclad guarantee for one year.

Easy to Install—Easy to Operate

The National can be installed on any car in about two hours' time. It is fastened to the front of the car in place of the crank. Total weight is about 15 pounds.

THE NATIONAL GAS ENGINE STARTER COMPANY
Dept. 551B, 30-32 N. Dearborn St., CHICAGO, U. S. A.

Car Owners: *Write us for literature and name of nearest "National" dealer.*

Manufacturers: *Write us for literature and our offer to install the National as standard equipment.*

A ten year old child can operate the National easily. One pressure of the foot—the crank shaft turns—the engine starts. Just a simple mechanical operation.

A Big Business Proposition

The tremendous demand for a *perfect* starter makes the selling end of the National only a matter of proving its merits. *Thousands and Thousands* of car owners will install the National as soon as they see it.

They'll want the advantages of the National for themselves as well as to enable the women-folks to drive.

You see the field is practically boundless.

Big business men consider this a big enough proposition to *open up special demonstrating salesrooms for the exclusive sale of the National.*

They realize the wonderful possibilities of the National.

The retail price of the National is $50.00 *completely installed.* Figure out approximately the number of cars in your territory and you will have an idea as to how broad a proposition this is.

Applications for Agencies Now Being Received

Already we have received thousands of applications for National agencies. We are literally *swamped* with requests. South America, England, Germany, France—energetic dealers in all these countries have applied for National agencies as well as thousands of American business men. But we are prepared to meet the tremendous demand.

THE NATIONAL STARTER
TRADE MARK

We have practically unlimited manufacturing and financial resources.

Agencies for the National Starter are now being allotted. Applications will be handled in the order in which they are received.

Wire us, and come to Chicago if you can—let us show you just how the National is built—let us tell you in a personal interview the tremendous business possibilities of this proposition.

If you cannot come, write us. Full information and large descriptive circular can be had by signing and mailing the coupon.

Coupon for Free information

The National Gas Engine Starter Co.,
Dept. 551B, 30-32 N. Dearborn St., Chicago.

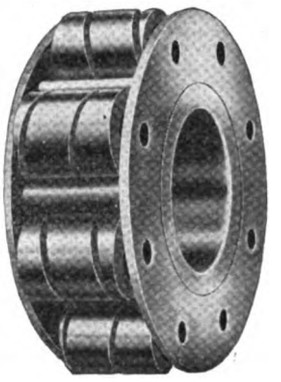
Gentlemen:

Please send me full particulars regarding a National Agency.

Name.....

Address.....

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Sound—Noise

THE ORIGIN OF SOUND is in the "vibratory movements of a sonorous body." For example, the "A" string of a violin to give its natural note must have 435 complete vibrations per second, while the lowest note employed in music ("C" of the 16 ft. organ pipe) has 32 vibrations per second.

HIGH NOTES SOUND LOUDEST to the human ear. In other words, our auditory apparatus is more susceptible to sounds caused by rapid vibrations even though their real intensity is the same as other sounds lower in the scale.

HIGH SPEED ENGINES, wheels covering roads none too good at speeds of forty to fifty miles per hour, and gears transmitting power from the engines to the wheels, all combine to produce in the motor car the rapid vibrations that can only result in excessive noise.

ATTENTION HAS BEEN GIVEN to many of the parts which permit of alteration and refinement to assist in quiet operation. Development of the Knight engine alone has been accomplished at a total outlay of something like one million dollars. Other inventors will shortly be heard from.

SOMETHING HAS BEEN WRITTEN concerning the various causes of gear box and axle noise. For even reasonable quietness the transmission case must of course be properly reinforced. All gears must be reasonably accurate as to form and must be properly mounted. Gear grinding is all right theoretically but it has not as yet attained commercial popularity.

LET US SAY RIGHT HERE that proper mounting is the real secret. This does not mean simply the use of even an admittedly good anti-friction bearing. It means a bearing of maximum efficiency but at the same time flexible enough to relieve the parts from the strains and vibrations of sudden shocks and jars.

THE ONLY BEARING with all the essential qualities—flexibility, efficiency and durability—is the Hyatt.

HYATT ROLLER BEARING CO.
DETROIT, MICHIGAN

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FRANKLIN "LITTLE SIX"

$2800

A new type of six—a small one.

Some sixes weigh twice as much. No other six weighs so little and no other is so compact.

Motor only thirty-horse-power—good as sixty-horse-power for what a man wants—the car itself is so light.

It is real work to drive a big car. It is real pleasure to drive a Franklin Little Six.

Many cars are going to more weight. This means harder driving, less comfort and more expense. The Franklin Little Six is the other type—a light car.

Weight and bulk are what the man buys who does not know. The man who does know buys lightness and agility.

Eight people out of every ten, would be absolutely satisfied with a Franklin Little Six.

It costs the least to own, runs the sweetest, looks the best and does the most because it is so practical and convenient.

FRANKLIN AUTOMOBILE COMPANY

Syracuse N Y

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Latest and Most Efficient MOTOR DRIVEN SIGNAL

At a Popular Price



SIZE
11 in. Over All; 7 in. Bell

Price $10

Newtone Superior

Three Years of actual road test has proven that this new product of the oldest warning signal manufacturing concern in the United States, is the KING OF THEM ALL! Six undeniable points of Superiority in the NEWTONE SUPERIOR are:

Durability Loud, Abrupt Warning Note Accessibility
Beauty of Design Popular Price
Least Current Consumption

¶ It is not a *buzzer* or a cheaply made motor driven horn; it is made of the best materials and embodies the best electrical and mechanical construction. A small electric motor, every running part of which is lubricated by a weatherproof oil cup placed on the outside of the casing, operates on a vanadium steel diaphragm, the vibrations of which generate a powerful note of warning. A very ingenious arrangement of the casing permits easy inspection of the commutator and brushes which are made of a material warranted not to cut the commutator or to accumulate moisture.

¶ The price of the NEWTONE SUPERIOR is the result of scientific BUSINESS MANAGEMENT, and of the great manufacturing facilities acquired with eight years experience in the exclusive manufacture of auto signals. It can be had in Brass, Black and Brass, Nickel or Black and Nickel, all at the same price, $10.00. DELIVERIES WILL BEGIN AUGUST 15th, 1912.

CAR MANUFACTURER: You need this signal for your 1913 equipment.

JOBBERS AND DEALERS: This is a signal that the public will buy; it has no come-back, uses only two amperes of current and is sold at the lowest price.

Automobile Supply Manufacturing Co.

220 Taaffe Place, Near DeKalb Ave. (Incorporated 1904) **BROOKLYN, N. Y.**

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WE are about to make the greatest bid for your contract signature any automobile manufacturer has ever made. Watch for our announcement. It will appear on August 17th.

¶ No more startling selling proposition has ever been offered than the Overland line for 1913. It will create an unprecedented demand. Overland dealers should break all sales records.

¶ Wait—We will startle the trade.

The Willys-Overland Company, Toledo, Ohio

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THE MOTOR WORLD

Vol. XXXII New York, U. S. A., Thursday, July 25, 1912. No. 5

KNOT FOR UNIVERSAL TO UNRAVEL

"Angel" of New York Company Disputes Its Transfer to Detroit Corporation—Seeks to Have It Set Aside.

While the Universal Motor Truck Co., of Detroit, is reorganizing itself into a million dollar corporation, a knot in which it is involved has developed in New York, growing out of its absorption, in April last, of the Universal Truck Co., of New York City, which handled Universal trucks in the metropolitan district. The trouble has taken legal form in two actions, instituted last week in the Supreme Court of New York County by George Wheeler, who still insists that he is treasurer of the New York company, the absorption of which he is seeking to have declared illegal.

Rock-bottom facts are difficult to obtain, as the bills of complaint have not yet been filed or served, apparently awaiting the arrival in New York of Fred K. Parke, whom the proof of service describes as vice-president, secretary, treasurer and general manager of the Detroit company. According to the allegations of the various parties to the proceedings, however, it appears that after the Universal Motor Truck Co. was organized the Universal Truck Co., of New York, was formed by Wheeler and Howard M. Walton, among others, its capital stock being $50,000, of which Wheeler claims to have provided between $30,000 and $40,000. Walton was made president, Wheeler treasurer and Albert Engelhart secretary. Apparently all went well until April 27th last, when at a meeting of the New York company Wheeler was deposed as treasurer and Samuel Mann, one of the company's salesmen, was chosen to fill the vacancy, Engelhart retiring and Wheeler being given the office of secretary. Following this meeting, which Wheeler declares was illegal, the Detroit company absorbed the New York concern, which now exists only as a branch, thus leaving Wheeler in a position not easily definable. Wheeler's side of the case, as nearly as can be learned, is that he provided nearly 80 per cent. of the capital of the New York company—in other words, was its "angel"; that the meeting of April 27th was illegal, and that the taking over of the New York company by the Universal Motor Truck Co., of Detroit, also was contrary to law.

It seems, according to information obtained from several sources, that when the New York company began to deal in Universal trucks, it gave the Detroit company a note for $2,000, putting up its entire capital stock as security. Whether the note was paid is not made clear, but at any rate the Detroit company still holds the stock.

Of Wheeler's two actions, one is directed against the Universal Truck Co., of New York, the Universal Motor Truck Co., of Detroit, Howard W. Walton, Fred K. Parke and Samuel Mann. It seeks to require them to make an accounting. The second action is leveled at the Universal Motor Truck Co. and Parke and demands the return of the New York company's stock.

Bowen Becomes President of Rutenber.

George W. Bowen, president of the Bowen Mfg. Co., of Auburn, N. Y., who recently acquired a large interest in the Western Motor Co., of Marion, Ind., which manufactures Rutenber motors, and who formed the Rutenber Motor Co. to take over the business, has been elected president of the new corporation, which is incorporated under Delaware laws with capital stock of $1,350,000. It is stated that the transaction ultimately will lead to the consolidation of the Bowen Mfg. Co. with the new Rutenber corporation.

Grossman-Vanguard Agreement Ended.

On August 1st next, when the selling arrangement with the Vanguard Mfg. Co., of Joliet, Ill., expires, the Emil Grossman Co., of New York, will discontinue the sale of Vanguard windshields. Thereafter the Grossman company will devote its energies to the production of Redhead spark plugs and its other specialties.

TWO DECREES FOR DYER PATENTS

After Several Delays, Court Orders Judgment by Default Against Palmer & Singer—Liveryman also Beaten.

After several postponements and more than a year of legal quibbling, one of the four original suits instituted by Leonard H. Dyer, who practically constitutes the Enterprize Automobile Co., against as many prominent automobile manufacturers to enforce the now famous Dyer transmission patents, Nos. 885,986 and 921,963, came to a head late last week, when judgment pro confesso was entered against the Palmer & Singer Mfg. Co., of New York City, in United States District Court for the Southern District of New York. Suit against the latter was instituted at the same time that similar actions were brought against the Winton Motor Carriage Co., the Locomobile Co. of America and Maxwell-Briscoe, Inc., the Winton, Locomobile and Maxwell suits being taken care of by the Automobile Board of Trade while the Palmer & Singer action was conducted more or less independently.

Palmer & Singer failed to file an answer or demurrer within the specified time, and since then several extensions have been granted for the filing of an answer, but not for the entering of a demurrer. The last extension expired Saturday, July 13th, on which day Palmer & Singer's attorney filed what was termed a demurrer, and at the same time secured from Judge Lacombe an order requiring the Enterprize company to show cause why the time should not be extended to the October rule day of the court. The Enterprize attorneys opposed the motion, citing, among other things, the numerous extensions of time which had been granted and asked for a judgment pro confesso, which, in simpler language, is a judgment by default. Judge Hand granted the motion, and his decree has been entered on the court rec-

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ords. The Dyer interests now will wait the expiration of a prescribed term of 30 days, when they will apply for an interlocutory decree and ask for the appointment of a master to take an accounting of the profits accruing to the Enterprize company from the Palmer & Singer Mfg. Co. Further intervention is possible, but if it is not successful a permanent injunction will be the next step.

Late last week the Enterprize Automobile Co. also secured a similar judgment against Albert Solvay in the United States District Court for the Eastern District of New York. Solvay, who is a liveryman operating two Darracq cars in Brooklyn, was charged with infringement of the two Dyer patents, but as he failed to present evidence in support of his answer and to appear at the final hearing, Justice Van Vechten Veeder ruled that the complainant's proof made out a prima facie case of infringement and granted the decree asked.

Simms Magneto Completes Reorganization.

After several months of planning, the reorganization of the Simms Magneto Co., of Bloomfield, N. J., at length has been effected, though all the officers of the new company, which will retain the name of the old one, have not yet been elected. C. G. Stoddard, whose former connection with the Dayton Motor Car Co. and present connection with the recently organized Edwards Motor Car Co., has served to bring his name into prominence, has been made president, F. R. Simms, who up to the time of the reorganization was president, having resigned that position. Simms remains a director, however; his associates are Edwards, A. A. Fisher, who is acting treasurer and who occupies a similar position with the Assets Realization Co., of New York, which company is financing the project, Campbell Carrington, who also is intimately connected with the affairs of the financing company, and H. M. Kilborn, who is vice-president of the National City Bank. The company has been reorganized with $1,750,000 capital stock, of which $1,000,000 is represented by the old stock of the company, all of which is common; the remaining $750,000 represents the new issue, of which $500,000 is preferred. All the new preferred has been subscribed, and after the proceeds have been applied to paying the outstanding debts of the company, it is expected that there will be at least $350,000 remaining with which to push production, which will be inaugurated immediately.

Yoeman Becomes Ames's General Manager.

George W. Yoeman, sales manager of the Continental Motor Mfg. Co., of Muskegon and Detroit, Mich., has resigned that position to become vice-president and general manager of the Ames Motor Car Co., of Owensboro, Ky. The Ames company is the outgrowth of the Ames carriage business, which has been conducted in the Kentucky city for the past thirty years. The Ames 1913 model will list at $1,585.

OBJECTS TO SUMMER TRUCK SHOW

New York Organization Opposed to N. A. A. M. Proposal—But Wants National Body to Further Parades.

Although the proposal to hold a monster Summer commercial vehicle show, either in addition to or to take the place of the usual Winter show, has been seriously considered by the National Association of Automobile Manufacturers, the matter having been referred to the show and commercial vehicle committees at the last meeting of the executive committee of that body, in order that the opinion of manufacturers and dealers with regard to the project might be ascertained, it is unlikely that anything will come of it, if the sentiment expressed at the last meeting of the Motor Truck Club of New York City can be taken as an indication.

The question of the advisability of staging such a show was the principal point that was discussed at the meeting, and the club finally went on record as opposed to the holding of any other than the national shows which are held in Madison Square Garden and Grand Central Palace each Winter, the concensus of opinion being to the effect that such a project would be detrimental rather than beneficial to the industry. Another suggestion which came in for more or less discussion was the advisability of holding a local truck show somewhere on the streets of New York, but it was pointed out that there would be difficulty in obtaining the necessary police permits, etc. Nevertheless, a committee finally was appointed to confer on the feasibility of holding a local commercial vehicle show in an arena of some sort in the vicinity of New York, the event to take place probably next Spring.

The matter of the annual parade also was much discussed, and it was voted to recommend to the N. A. A. M. that an effort be made to hold truck parades on some designated day simultaneously in the various large cities, the belief being that such a unified and concentrated showing would cause a great deal more enthusiasm and talk than a single parade in a single city. In connection with such parades, it was proposed, tentatively, that they might be arranged to be brought to a close with a general parking of the vehicles in line in order to effect a co-operative display.

Southern Railroads May Increase Rates.

If E. M. Goodwin, the representative of the L. & N. Railroad, had his way, there would be no carload rates on tires or anything else. Goodwin said so at the annual meeting of the Southern Railway Association in Atlantic City, at which J. S. Marvin, traffic manager of the National Association of Automobile Manufacturers was present. Goodwin's remark was brought out by Marvin's plea for the establishment of a carload rate on tires, which at present does not exist. The Southern Railway Association, which controls traffic south of the Ohio River and east of the Mississippi, is bent on increasing the rate on automobiles, in carload lots at least. At its meeting in Atlantic City, it considered a proposal to reduce the minimum weight for automobiles in carload lots from 10,000 to 5,000 pounds, and as they bear a double first class rate this change would serve to double the rate. Marvin made a strong protest but no decision has yet been reached.

Many More Assembling Plants for Ford.

In addition to the service stations and assembling plants which the Ford Motor Co., of Detroit, already maintains in New York City—to which four stories are to be added—and Kansas City, and in addition to those which, as already is known, are to be located in St. Louis, San Francisco, Los Angeles, Portland and Seattle, it transpires that it is the Ford intention to locate similar establishments in Boston, Philadelphia, Chicago, Minneapolis, Denver and Memphis, the smallest of which, incidentally, will be larger than was the entire Ford factory eight years ago. James Couzens, secretary and treasurer of the Ford company, indicates that the establishment of these assembling plants will reach unusual proportions and that there will be 20 or 30 of them when the Ford plans are carried to completion.

Mosler Accuses Wooster of Price-Cutting.

Claiming that William Wooster, trading under the high-sounding name and style of Automobile Surplus Stock Syndicate and having three places of business in New York City, infringed the Mosler patents under which Spit-Fire spark plugs are made, by selling them at less than a stipulated price, A. R. Mosler & Co., of New York City, brought suit against him late last week in United States District Court for the Southern District of New York. The complainant asks an order restraining Wooster from infringing the patents, Nos. 698,042 and 738,831, and from selling or otherwise handling Mosler spark plugs.

Nash Now a General Motors Official.

C. W. Nash, for the past two years vice-president and general manager of the Buick Motor Co., of Flint, Mich., has been appointed vice-president of the General Motors Co. to fill the vacancy caused by the resignation of W. J. Mead, who recently assumed the presidency of the Amplex Motor Car Co., of Mishawaka, Ind. As the Buick company is one of the subsidiaries of the General Motors Co., Nash, despite his new honors, still will remain the directing head of the Buick plant.

Cole Increases Capital to $500,000.

The Cole Motor Car Co., of Indianapolis, has increased its capital stock to $500,000. Its previous capitalization was $300,000.

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CLIMAX IN MAIS TRUCK AFFAIRS

Enforcement of Mechanics' Lien Leads to Appointment of Receiver—Plant Probably Will Be Offered for Sale.

Trouble which has pursued it for several months culminated last week in the appointment of Franklin Vonnegut as receiver for the Mais Motor Truck Co., of Indianapolis. The receivership grew out of the application of Edward King, a contractor, who asked also that the Mais plant be sold to satisfy his mechanic's lien of $2,250. The court indicated that it probably would grant this application and order the plant sold within 30 days. King performed some building operations for the Mais company to the value of $5,050, of which but $2,800 has been paid.

At the time the receiver was appointed several creditors sought to have Frank D. Stalnaker, president of the Indiana National Bank, named for that position, but objections were lodged, as the bank is one of the creditors of the Mais company.

In November last Harold S. Block, a stockholder, made charges against the company and asked the court to appoint a receiver, but the action was not pressed. It was quite generally known, however, that the Mais company was not sailing on smooth water, but it was understood that reorganization was in progress, and until two weeks ago it was believed that receivership proceedings would be avoided. At that time, Will H. Brown, president of the company, interested capital in Peru, Ind., and in that city organized the Brown Commercial Car Co., which will manufacture a light truck, which action on his part was taken to foreshadow a climax in Mais affairs.

Former Warren Men Form New Company.

J. G. Bayerline, former general manager of the Warren Motor Co., of Detroit, and T. A. Bollinger, who was factory manager for the same company, practically have completed the organization of a $300,000 company which will establish itself in Detroit and produce a 30-horsepower touring car, which will be listed at $1,050. J. G. Seigfried and W. L. Daly, who also were connected with the Warren company, are associated with Bayerline and Bollinger in the new enterprise, in which Toledo, Chicago, Detroit and California capital is interested. The Californian who is interested and who will be sales manager of the new company, last year marketed 300 cars on the Pacific Coast, in which territory he has 148 sub-agents. Although the name of the company has not yet been chosen, plans are so far advanced that a factory in Detroit already has been secured and orders have been placed for material for 2,500 cars, the first of which already is operating on the streets of Detroit. It is an attractive model, having four cylinders, 3¼ x 5 inch, Warner transmission, multiple disc clutch, full floating rear axle, Bosch magneto, Stromberg carburetter and 110-inch wheelbase.

Westinghouse Gets $104,000 from Bergdoll.

Judgment for $104,000 was entered on Thursday last, 18th inst., in the Common Pleas Court No. 4, at Philadelphia, in favor of the Westinghouse Machine Co. against the Louis J. Bergdoll Motor Co., of Philadelphia, the judgment growing out of a suit involving a contract for 1,000 gasolene motors which the Bergdoll company had placed with the Westinghouse corporation. The contract, executed May 15, 1910, called for the delivery of 100 motors a month, the Bergdoll company agreeing to pay $210,000 in specified installments. When 550 motors had been delivered, a disagreement arose which caused the Westinghouse company to call the law to its aid. The Bergdoll company set up a counter claim for damages, alleging that the motors had not been delivered according to specifications, but the court ruled that the contention was without merit and gave judgment to the Westinghouse company for the full amount.

Morgan Truck Acquires New President.

Charles B. Foster, for the past ten years president of the Foster & Richardson Bedstead Co., of Westboro, Mass., has acquired an interest in the Morgan Motor Truck Co., of Worcester, Mass., of which he will assume the presidency on August 1st. Although one of the pioneers in the commercial vehicle industry, the Morgan company has had a long succession of ups and downs and several times has undergone reorganization. Foster's entry into its affairs marks a somewhat similar stage in its existence.

Federal Court Names DeTamble Receiver.

Supplementing two petitions in bankruptcy which already are pending in state courts, three creditors last week filed a similar petition in the Federal court of Indiana against the DeTamble Motors Co., of Anderson, Ind. They charge that while insolvent the company has made preferential payments to certain creditors. Their petition was granted, J. C. Teegarden, of Anderson, being named receiver.

Mutual Taxameter Ceases its Ticking.

Alleging preferential payments, Ducasse & Co., of New York, and two other creditors whose claims amount to $5,818.14, on Monday last, 22nd inst., filed a petition in bankruptcy against the Mutual Taxameter Cab Co., of 249 West 80th street, New York. Its liabilities are said to equal that amount, but its assets are not given.

Kinsey Increases Capital to $3,000,000.

The Kinsey Mfg. Co., of Toledo, O., which is one of the John N. Willys group, has trebled its capitalization—from $1,000,000 to $3,000,000.

KLAXON IS DENIED AN INJUNCTION

In Denying it, Federal Court Expresses Opinion of Conditional Licenses—Decision Favors Rhode Island Jobber.

Declaring that conditional licenses, such as attach to the sale of Klaxon horns, are "questionable" and are "likely to impose upon the purchaser catchy bargain conditions which he does not appreciate," Justice Brown, sitting in the United States District Court in Providence, R. I., on Tuesday last, 23d inst., denied the application of the Lovell-McConnell Mfg. Co., of Newark, N. J., for an injunction restraining the Waite Auto Supply Co., of Providence, from the further sale of Klaxon horns and also the sale of Newtone horns, to the handling of which by the Waite company the institution of the proceedings was due.

The Lovell-McConnell license, which is attached to each Klaxon horn, carries with it the recognition by the purchaser of the validity of the Klaxon patents, violation of which, in any form, is considered sufficient to render the purchaser "objectionable." As the Newtone horn is alleged to infringe the Klaxon patent, the Lovell-McConnell company, following its procedure in other courts, sought to restrain the Waite company from handling not only the Klaxon product but the Newtone horns also, which application, if granted, would serve to render valueless the horns which the Waite company has on hand. Judge Brown stated, however, that such forfeitures "are not favored by equity and will not be aided on merely technical ground." He also held that the "complainants have failed to show that they are likely to suffer such irreparable injury pending final hearing as to require a preliminary injunction."

While several similar actions have been tried in other courts, the proceedings before Judge Brown reached further and went into phases of the situation which had not previously entered into argument. His decision, therefore, had been awaited with unusual interest as tending to clarify the confused situation caused by the extended litigation in which the manufacturers of the Klaxon and Newtone horns are engaged. Judge Brow's decision denying the injunction is as follows:

"This is a petition for preliminary injunction against alleged infringement of Letters Patent Nos. 923,048, 923,049 and 923,122, to Hutchison, May 29, 1909. The patents relate to mechanically actuated diaphragm horns or alarms. Certain of these horns were sold to the defendant with a label attached thereto, to the effect that they were received and sold only under and subject to certain conditions.

"The bill alleges that by purchase, by acceptance and by resale, the defendant is a purchaser who has specifically acknowl-

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edged the validity of said patents and that by reason of the premises the defendant is now estopped to deny the validity of said patents.

"The bill also alleges that the defendant also signed a supplementary selling license wherein it acknowledged its familiarity with the complainants' system of selling horns under conditional licenses. It is charged that the defendant has advertised and sold and threatens to continue to advertise and sell automobile horns designated as the Newtone horn, made by another manufacturer, but embodying said inventions, in infringement of the rights of the complainants.

"The bill prays an injunction against the manufacture, use or sale of the complainants' horns, known as Klaxon and Klaxonet, of the kind purchased by the defendant, and also for an injunction against the use or sale of the Newtone horn, or any similar horn, at the same time that it uses advertises or sells the horns manufactured by the complainants, and also against purchasing complainants' horns without special written permission of the complainants.

"Under ordinary rules a preliminary injunction against the sale of Newtone horns would be denied upon the complainants' showing. The proposition that the defendant has estopped itself from contesting the validity of the patents in a suit to enjoin the sale of the products of other manufacturers is very doubtful.

"The condition as to the acknowledgement of the validity of the patents seems rather a limitation of rights acquired in the use of a particular instrument than a general agreement with the vendor. Even should it be held that the relation established by purchase with knowledge of such conditions, is strictly constructural, a point that requires further consideration, there is good ground for thinking that such contract must be confined to specific subject matter for sale.

"It is a peculiarity of this form of license that by its terms the instrument itself is licensed. The proposition that the purchaser of one of these instruments, with knowledge of the conditions, has thereby agreed to acknowledge the validity of the patents, in suit for all purposes, and in respect to other articles, is questionable for several reasons.

"The acceptance of this proposition would be likely to impose upon a purchaser by a catchy bargain condition, which he did not appreciate. Upon motion for a preliminary injunction against the use of Newtone horns, I am of the opinion that the complainants' case is not aided by the contention that the defendant is estopped or has agreed not to contest the validity of the patents in respect thereto.

"The case presents also a further question as to whether equity should lend its aid to enforce the provisions in respect to a single instrument and shall revoke all rights as to other instruments in the violator's possession. Forfeitures of this character are not favored by equity and will not be aided on merely technical grounds.

"Furthermore the complainants fail to show that in respect to sales of Klaxon or Klaxonet horns by the defendants, the complainants are likely to suffer such irreparable injury pending a final hearing as to require a preliminary injunction. The petition for a preliminary injunction is denied."

Changes Among Prominent Tradesmen.

Charles S. McCarthy has resigned the position of superintendent of the Wagner Mfg. Co., of Toledo, O. After a short vacation, he expects to return to that city, where he again will engage in business.

A. H. Brown, manager of the Studebaker Corporation's Spokane (Wash.) branch, has been promoted to the post of northwestern sales manager. He will continue to make his headquarters in Spokane.

J. G. Satterthwaite has been appointed manager of the Philadelphia branch of the Whiting Motor Co., which recently took over the Mercer branch in that city. Previously, Satterthwaite was manager of the Trenton (N. J.) branch of the Stoddard-Dayton company.

Benjamin Geddis and D. C. Richardson, both of whom have been connected with the Warren Motor Car Co.'s Detroit branch, have resigned, the former to manage the Warren car department of the Forbes Motor Co., of Pittsburg, Pa., and Richardson to become sales manager for Forbes Motor Co., of Pittsburgh, Pa., and ton, D. C., which also handles the Warren car.

L. C. Smith, who has been serving on the General Motors advertising staff in Detroit, has been appointed advertising manager for the Olds Motor Works, with headquarters at the factory in Lansing, Mich. He succeeds to the vacancy caused by the resignation of George L. East, who has been appointed advertising manager for the Amplex Motor Car Co., of Mishawaka, Ind.

Edward H. Habersham, who for some time has been doing confidential work for the Studebaker Corporation's sales department, has been appointed manager of that company's Washington (D. C.) branch. He succeeds Walter C. Vliet, who is to be promoted to an important assignment in the Studebaker service in the West. Incidentally, the Washington branch, which heretofore has been operated under the title E-M-F Washington Co., hereafter will be conducted in the name of the Studebaker Corporation itself.

Cancels Option, Universal Will Expand.

When the Metzger-Flanders amalgamation was steaming hot two months ago, and when the prospect of a merger of considerable magnitude appeared probable, it was freely stated that the Universal Motor Truck Co., of Detroit, was a party to the negotiations, which reports, however, were several times denied. The truth came out last week, however, at a meeting of the board of directors of the Universal company, when it was made known that an option on the Universal plant had been granted to Walter E. Flanders and his associates and that it had been formally canceled. It is understood that the cancelation last week did nothing to further the good feeling existing between the several parties to the negotiations.

Having decided to go it alone, the Universal company is preparing to become a million dollar corporation and is laying plans for the erection of what is designed to prove the largest exclusive truck producing plant in the world. It will make a specialty of a one-ton worm driven model, which has been developed during the past year. Fred K. Parke, at one time a vice-president and confidential member of the Studebaker staff and an intimate associate of Walter E. Flanders, will remain vice-president and general manager of the Universal Motor Truck Co., the control of which rests with George Uhlein, who is identified with the Schlitz brewery interests in Milwaukee, and W. S. J. Kopmeier, of Detroit, both of whom are also stockholders in the Flanders Mfg. Co.

Van-L Truck is Declared Bankrupt.

The Van-L Commercial Car Co., of Grand Rapids, Mich., has been formally adjudicated a bankrupt by the Federal court in that city, Kirk E. Wicks being appointed referee in bankruptcy. The adjudication follows a petition filed late last month by stockholders, asking the appointment of a receiver on the grounds that the company transferred or attempted to transfer its assets to the Commercial Service Truck Co. in fraud of the Van-L creditors and stockholders, it being alleged that the Commercial company was organized to take over the Van-L.

American Completes Factory Enlargement.

Due to the completion of an addition to its plant in Indianapolis, the American Motors Co. now claims to possess the largest automobile factory in that city. The new building is an imposing structure of three stories, 85 x 100 feet, and provides about 35,000 square feet of floor space. The company already is equipping the plant, the new machinery being of the most modern design. One piece that is being installed is a 36-ton hydraulic press which is to be used for shaping the American underslung bodies and sheet metal work.

Haas Tire Seal Admits it is "Broke."

The C. W. Haas Tire Seal Co., which maintains an office and garage at 800 Hamilton street, Peoria, Ill., has filed a petition in bankruptcy. Its liabilities amount to $9,074 and its assets to $10,251.59. The latter comprise open accounts, $6,945.77; patents, $1,000; stock, $2,300; and cash, $582.

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THE WEEK'S INCORPORATIONS




Kansas City, Mo.—Place Garage Co., under Missouri laws, with $5,000 capital; to operate a garage.

Coldwater, Mich. — Coldwater Garage, under Michigan laws, with $3,000 capital; to operate a garage.

Dover, Del.—Keystone Automobile Exchange, Inc., under Delaware laws, with $100,000 capital; to deal in motor cars.

Hager, J. W. Hager, A. Z. Hager, R. T. Pitman.

Buffalo, N. Y.—Mason B. Hatch, Inc., under New York laws, with $20,000 capital; to deal in motor cars. Corporators—Mason B. Hatch, Isabelle W. Hatch, John Chipman.

St. Louis, Mo.—Burns-Ramsden Motor Car Co., under Missouri laws, with $10,000 capital; to deal in motor cars. Corporators—Louis N. Burns, J. H. Ramsden, Harry C. Barker.

Des Moines, Ia.—Thermon Mfg. Co., under Iowa laws, with $10,000 capital; to manufacture motor devices. Corporators—K. N. MacDonald, W. P. Bair, W. A. Spurrier, Jr.

Des Moines, Ia.—No-Air Tire Filler Co., under Iowa laws, with $10,000 capital; to manufacture tire filler. Corporators—Edward Crawford, William Nutter, Lon H. Boydstron.

Cleveland, Ohio—Saunders Auto Supply Co., under Ohio laws, with $10,000 capital; to manufacture motor devices. Corporators—C. J. Robinson, S. W. Sparks, J. A. Blakley and others.

Chicago, Ill.—Chicago General Motorbus Co., under Illinois laws, with $1,000 capital; to operate a motor bus line. Corporators—Henry W. Berg, W. C. Norton, John Reckinger.

Indianapolis, Ind. — Janney Electric Starter Co., under Indiana laws, with $100,000 capital; to manufacture motor starters. Corporators—C. D. Janney, Russell Wilson, W. L. Taylor.

Terre Haute, Ind.—Little Wonder Light Co., under Indiana laws, with $10,000 capital; to manufacture lighting equipment. Corporators—Charles Van Slyke, C. P. Walker, H. R. Ihrie.

Burlington, Ia.—Hawkeye Motor Car Co., under Iowa laws, with $15,000 capital; to manufacture motor cars. Corporators—H. L. Madison, E. L. Horsford, L. H. Vahle and others.

West Allis, Wis.—West Allis Machinery and Auto Co., under Wisconsin laws, with $1,000 capital; to operate a machine shop Corporators—Joseph W. Moore, Frank Meyer, James McCue.

Pontiac, Mich.—Hemmeter Spark Gap Mfg. Co., under Michigan laws, with $6,000 capital; to manufacture spark gaps. Corporators—Henry C. Hemmeter, Cassius C. Van Wagoner, John Snyder.

New Brunswick, N. J.—Consolidated

BIRD'S-EYE VIEW OF LOCOMOBILE PLANT AT BRIDGEPORT, CONN., AFTER ITS ENLARGEMENT



With recent additions, the floor space is equivalent to more than eight acres, all parts of the Locomobile models now being manufactured on the premises.

Dover, Del.—Keystone Automobile Exchange, Inc., under Delaware laws, with $100,000 capital; to deal in motor cars.

Springfield, Ill.—Triumph Motor Car Co., a South Dakota Corporation, with $75,000 capital; admitted to do business in the State of Illinois.

St. Louis, Mo.—Model Auto and Sales Co., under Missouri laws, with $3,000 capital; to deal in motor cars. Corporators—Oscar Sonntag, Roy E. Stults, Otto F. Karbe.

East Orange, N. J.—Orange Garage, under New Jersey laws, with $20,000 capital; to operate a garage. Corporators—S. L. Gedney, Jr., J. D. Gedney, H. R. Picking.

Nashville, Tenn.—Hager Motor Car Co., under Tennessee laws, with $5,000 capital; to deal in motor cars. Corporators—L. S.

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Auto Supply Co., under New Jersey laws, with $1,000,000 capital; to deal in motor car supplies. Corporators—B. F. Hardesty, Arthur V. Dennan, Samuel Ross.

Peru, Ind.—Brown Motor Truck Co., under Indiana laws, with $100,000 capital; to manufacture motor trucks. Corporators—William H. Brown, C. H. Wallerich, R. A. Edwards, R. H. Bouslog, Max Kraus.

Cincinnati, Ohio—Acme Motor and Delivery Co., under Ohio laws, with $15,000 capital; to operate a motor delivery. Corporators—William E. Minor, Fred K. Allen, Stuart B. Stutphin, David Wachman, Bradford Minor.

Cincinnati, Ohio—King Valveless Auto Whistle Co., under Ohio laws, with $25,000 capital; to manufacture motor car devices. Corporators—Delroy Fiffield, Orville C. Snyder, George H. Burrows, R. E. McMasters, C. J. Lowrie.

New York, N. Y.—Essenkay Sales Co., under New York laws, with $100,000 capital; to deal in tire fillers, etc. Corporators—Henry S. Young, 101 West 83rd street; Byron F. Abbott, 996 Simpson street; William C. Oliver, 425 West 42d street.

Brooklyn, N. Y.—E. Reinking Automobile Supply Co., under New York laws, with $5,000 capital; to deal in motor car supplies. Corporators—Emil Reinking, 376 Euclid avenue; John Lucht, 85 Hill street; Bernard Nienstedt, 207 Hemlock street.

New York, N. Y.—Fifty-second Street Auto Repair Co., under New York laws, with $2,000 capital; to repair motor cars. Corporators—Arthur Williams, Jr., 325 Amsterdam avenue; Harold Matzinger, Mount Vernon; Anna H. Darre, 930 St. Nicholas avenue.

New York, N. Y.—International Autolamp Mfg. Co., under New York laws, with $300,000 capital; to manufacture lamps, etc. Corporators—Hyman Agar, 821 Bergen street, Brooklyn; Nathan Agar, 25 Broad street; Thomas Cunningham, 155 Huntington street, Brooklyn.

Far Rockaway, N. Y.—Far Rockaway Motor Cab Co., under New York laws, with $25,000 capital; to operate a taxicab service. Corporators—Edwin Sommerich, 624 Broadway, New York City; Joseph L. Steinman, 10 East 33rd street; Arthur Behel, 37 West 26th street, New York City.

Changes of Capital and Name.

Toledo, Ohio—Toledo Motor Truck Co. from $95,000 to $150,000.

Cincinnati, Ohio—Hanauer Automobile Co. from $20,000 to $50,000.

Springfield, Ill.—Springfield Auto Sales Co. from $35,000 to $50,000.

Santa Barbara, Cal.—El Camino Real Motor Car Co., from $15,000 to $25,000.

Columbus, Ohio—Akron Rubber Motor and Machine Co. from $10,000 to $30,000.

Chicago, Ill.—Automobile Owners' Association from $100,000 to $50,000 and name changed to Service Mfg. Co.

KNIGHT-ARGYLL SUIT MOVES SLOWLY

Litigation Over Sleeve-Valve Rights In England Drags—Defense Asserts Engine as Patented Inoperable.

The litigation which was inaugurated last November, immediately after the appearance of the Argyll sleeve-valve engine at the Olympia show in London, was brought to a partial head last week, when for the first time the suit for alleged infringement of patents brought by the Knight & Kilbourne Patents Co. against the Argyll company of Edinburgh, Scotland, came up for a hearing, the action being heard by Justice Neville in No. 3 Chancery Court. By reason of the voluminous character of the evidence, which included several engines and working models, however, the case still rests with the court, no judgment having been rendered as yet.

When the suit was instituted by the Knight & Kilbourne company, infringement of two of the four claims in its patent No. 14,729, of 1905, were alleged, these claims being as follows:

"1. The herein-described improvements in an internal combustion motor comprising the cylinder and a member telescoped therewith, said member comprising a head and a valve seat, one internal and the other external to the cylinder, said member and cylinder being relatively movable and the cylinder having ports adapted to be covered and uncovered by said relative movement, and a piston in the cylinder, in combination with means for substantially as herein described imparting to one of the aforesaid telescoped parts a movement which is relative to the other aforesaid telescoped part and variable with relation to the movement of the piston for covering and uncovering the ports."

"4. The herein-described improvements in an internal combustion motor, combined, constructed, and arranged substantially in the manner and for the purpose set forth."

In the argument for the defense, the usual claim of anticipation was set up, and it was contended, therefore, that no infringement was possible. In addition, it was alleged that no useful result could be achieved by following the specifications of the patent, and a counter-claim for its revocation was entered. In substantiation of the claim that the engine as described in the patent specifications was inoperable, and even if materially altered would remain of no practical use, it was pointed out that when the valve motion was plotted, the exhaust valve opened on the compression stroke. In fact, it was around this particular feature that much of the controversy raged.

In summing up for the plaintiff, it was argued that the Argyll engine was substantially a copy of the Knight engine and was an infringement of the rights of the owners of the patent covering it. In denying the contention of anticipation set up by the defendant, it was alleged that not a single paper had been submitted which had definite bearing on the combination of mechanism and movements covered by the Knight patent. In addition, referring to the defendant's contention that the patent specifications covered an engine which could not possibly be made to operate as shown, it is alleged that the defendants "were attempting to cloud the real issue insomuch as they were alleging various points against and anent the said specification which were not directly related to its function, viewed purely as a specification, but could only hold water on the assumption that the drawings in the specification were intended as working drawings." This was denied, and it was pointed out that patent specifications were never intended to be working drawings, no single instance where they were held to be such ever having been cited.

Though it is almost a year since the first action in the case was taken, the Argyll company has shown no disposition to discontinue the production of its unique type of sleeve-valve engine. Instead, it has continued to manufacture it in considerable numbers, and they have been disposed of as fast as completed. In every case, however, an indemnity has been offered to purchasers who might have feared litigation.

White Electric System on all Models.

Although only the six-cylinder model in the White line, which is produced by The White Co., Cleveland, O., heretofore has been equipped with the electric lighting and engine starting system, which was developed especially for it, all the models hereafter will be equipped with it. These include, in addition to the "six," the two four-cylinder models, one rated at 30 horsepower and the other at 40 horsepower. Briefly, the system embraces a combined dynamo and generator, which is connected to the engine through the intermediary of a "silent" chain, a liberal sized storage battery and the necessary switches for controlling the lamps and the starter.

Haynes Takes Over San Francisco Agency.

The Haynes Automobile Co., of Kokomo, Ind., have taken over the Haynes Auto Sales Co., of San Francisco, and hereafter will operate the establishment at Van Ness avenue and Turk street as a factory branch. W. B. Cochran, who was president and general manager of the San Francisco company, will remain in charge of the branch.

England's Exports Still Exceed Imports.

For the six months ending with June, England's export of automobiles and parts attained a total of £1,618,887, as compared with £1,459,069 during the corresponding period of last year. During the same period the imports increased even more markedly—from £3,056,177 to £3,674,733.

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Joseph Nagle is about to open a garage in Brookfield, Ill.

Joseph Haertl is about to open a garage in Fox Lake, Wis.

The Louser stables in Lebanon, Pa., are being converted into a garage.

F. A. Fridley of Redlands, Cal., has purchased the Orange Street Garage.

The Nampa Lumber Co., of Nampa, Id., is building a garage, 50 x 140 feet.

Dr. J. M. Willis is erecting a commercial vehicle garage in Williston, Fla.

J. O. Tanner is building a fireproof garage on Walnut street, Columbus, Tex.

A. W. Fiske, an attorney of Ridgefarm, Ill., is about to build a garage, 93 x 38 feet.

Bert Norton of Napa, Cal., is building a garage, 35 x 85 feet, on Randolph street, near First.

W. H. Dillon is about to enter the automobile delivery business in Excelsior Springs, Mo.

George E. Robbins has opened a garage in Tampa, Fla.; it is located at Tampa and Jackson streets.

Torke Bros. are erecting a brick garage at Plymouth, Wis. They will expend $30,000 on the structure.

Shadle & Shull, a Montpelier (Vt.) garage firm, has dissolved; R. M. Shadle purchased James Shull's interest.

O'Briant & Jones, of Durham, N. C., have taken over and will conduct the garage business of Mangum & Morris.

A garage on Gold street, Negaunee, Mich., owned by D. D. Smith, has been leased to the Negaunee Garage Co.

H. W. Vaughn and E. J. Lee, owners of the Century Garage, in Watsonville, Cal., have sold out to R. Neill and S. Redwine.

Jason Chandler and Harris Biedsoe of Kosse, Tex., have purchased the J. T. Pritchard Garage; they will continue the business.

Permission has been granted to H. McFarland, of Chicago, to build a garage at 526-530 South Canal street; it will cost $5,000.

H. W. Yeager, president of the Yeager Piano Co., of Hartford, Conn., has "gone into" automobiles; he has taken the Velie agency.

Elmont and Clarence E. Brooks, of Santa Rosa, Cal., have purchased the Turlock Garage; they will adopt the style Brooks Auto Co.

William Braithwaite is erecting a garage in Esmond, N. D. Also he will operate a stage service between that town and nearby localities.

A. Friedman & Sons Co., of Milwaukee, Wis., has secured permission to build a garage on Lisbon street, near 25th; its cost will be $9,000.

W. A. Platt, of Mt. View, Cal., has purchased the automobile part of the business of Leach & Higdon; he will assume charge of it August 1.

West Allis Machinery & Auto Co. is the style of a new organization in West Allis, Wis.; a garage will be operated at 686 73d avenue.

Henry Koch & Co. of Newark, N. J., have accepted plans for a garage, 64 x 89 feet, to be built at 32-34 Wickiffe street; its cost will be $6,000.

Under the style Miller Motor Car Co., Hardie & Gillette, of Chicago, Ill., have opened up at 1806 Michigan avenue; they will handle the Miller car.

C. A. Burton of Findlay, O., has purchased the Main Garage at 300 North Main street from George Hale; Burton personally will conduct the business.

The Bournonville Realty Co. of 250 West 64th street, New York City, has secured permission to erect a two-story garage, 75 x 95 feet; it will cost $33,000.

F. M. Prince is about to erect a two-story steel and concrete garage at 27 Groveland terrace, Minneapolis, Minn. It will represent an expenditure of $10,000

Hannaford Barr and George Stilphen have formed a co-partnership in Sanford, Me., and will operate a garage on Mechanic street; the firm style is Maine Auto Co.

J. E. Granger of Long Beach, Cal., has leased the Central Garage, opposite the City Hall; he will handle the Brush and Detroiter cars and a line of accessories.

W. V. Caldwell and H. B. Bailey of Los Angeles, Cal., are erecting a white glazed brick garage at Newlin and West Philadelphia avenues; its cost will be $10,000.

A community garage with individual booths for motor car owners is to be erected at 821 Quincy street, Topeka, Kan. J. S. Warner, a dealer, is sponsor for the scheme.

Mrs. C. G. Castruccia, of Los Angeles, Cal., has been granted authority to build a garage at 2438 South Grand street; it will represent an expenditure of $7,410, according to plans.

H. H. Quine, of Denver, Col., has let the contract for a garage, 50 x 185 feet, to be located on Broadway between Fourth and Fifth avenues; it will represent an expenditure of $12,000.

Permission has been granted the House and Home Realty Co. of St. Paul, Minn., to build a garage, 60 x 150 feet, at 237 West Ninth street; the plans call for an expenditure of $30,000.

Under the firm style Up-to-date Garage, Ernest Wright has opened up at Chestnut and Ocean avenues, Long Beach, Cal. Wright has the agencies for the King car and U. S. Motor trucks.

M. J. Osborn, owner of a garage at 15 East 9th street, St. Paul, Minn., has purchased the garage of the Western Automobile Co. at 338 Cedar street; he will operate both establishments.

Replacing a stable which was destroyed by fire, the Pavilion Hotel, Montpelier, Vt., is about to build a garage; it will be of three stories and will be equipped with power elevator and other modern appliances.

H. F. Sundin, formerly a traveling representative of the National Motor Vehicle Co., of Indianapolis, Ind., has been made distributer for that company in Kansas City, Mo. He will have salesrooms on Grand avenue.

Burson & Fowler, operators of the Mission Garage in Santa Paula, Cal., have sold out to J. Standlee; Burson, however, will retain an office in the garage and continue as agent for E-M-F, Flanders and National cars.

Theodore H. Bower of Providence, R. I., has purchased an interest in the American Supply Co., of Tampa, Fla., and arrangements are being made for the improvement of the property; the concern carries Lambert cars and trucks.

Under the style Service Auto Co. four young men of St. Paul, Minn., have entered the garage field with quarters at 199 West Fifth street; the quartet consists of Benjamin F. Kartak, Dean Laroche, LaRoy Ensley and Joseph Tighe.

Miss Mabel Pitt of Des Moines, Ia., has sold her interest in the Pitt-Matthews Carriage and Auto Co. to Edwin V. Matthews and Richard G. Priebe; they will continue the business, having amended the articles or incorporation to eliminate the name of Pitt from the firm title.

Arch Kirkwood, a blacksmith, at 10 North Broadway, Pittsburg, Kan., is branching out into the garage field; he is building an addition to his shop and will have associated with him in business Geo. H. Bailey, formerly an employe in the Alexander Garage, in the same town.

The Jones Auto Co., of Oakland, Cal., which previously handled Regal automobiles in connection with accessories, has discontinued the sale of cars and hereafter will confine itself to the accessory jobbing trade. The two stores which the Jones

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company previously maintained have been thrown into one and the company now claims to be one of the largest supply houses in its vicinity.

The Little Motor Car Co., of Flint, Mich., has established a branch in Indianapolis, at 338 North Delaware street. It is in charge of H. C. McVey, who previously was identified with the Buick branch in the same city.

A new Apperson agency has been formed in Omaha, Neb., consisting of J. H. De Long and Hans P. Neble; the latter's two sons will be connected with the business. For the present the old Apperson store at Eleventh and Farnam streets will be retained.

On the application of the Everitt Motor Car Co., of Detroit—formerly the Metzger Motor Car Co.—the Metzger Motor Car Co., of Denver, Colo., has been thrown into bankruptcy. Save for the relation of manufacturer and dealer, there was no connection between the two companies, although they bore the same name.

C. K. Eagle and J. C. Brown, members of J. H. & C. K. Eagle, a Shamokin (Pa.) silk manufacturing concern, and owners of the Edgewood Garage in that town, have purchased the business of the Shamokin Automobile Co. The latter's establishment is 160 x 60 feet and is well equipped, and henceforth will be styled Edgewood Garage, the title of the purchasers' first establishment. L. D. Kamp is manager of the business.

Landlord Acts Against Wishart-Dayton.

Because of alleged failure to pay the June and July rent on the premises at 318 West 48th street, New York City, judgment was taken this week against the Wishart-Dayton Auto Truck Co., by A. W. H. Nichols for $605.81, and has been entered in the New York county clerk's office. The company maintains an office at 501 Fifth avenue but rented the 48th street building for storage or service purposes, it is said.

Two More Abandon Yearly Model Policy.

Two more conspicuous companies have abandoned the "yearly model" policy—the Pierce-Arrow Motor Car Co., of Buffalo, N. Y., and The White Co., of Cleveland, O. Their cars no longer will be designated by years, such mechanical changes as are deemed necessary being incorporated whenever they are found advisable and without concentrating such action at the close of the seasons.

Making Room for More Michigan Cars.

To relieve the pressure on its busy plant, and to permit of an increased output of Michigan cars, the Michigan Buggy Co. last week broke ground for an enlargement of its factory in Kalamazoo, Mich. The enlargement will comprise a four-story steel and concrete building, which will afford 50,000 square feet of additional floor space.

VAN WAGONER PATENT LOCATED

Claimed to Control Shaft Drive for Electrics and Litigation is Likely—Involved in Buffalo Merger.

Some three months ago, when the Buffalo Electric Vehicle Co. was formed and took over the Babcock Electric Carriage Co. and the Clark Motor Co., among other properties, the attractiveness of the Clark company was not wholly clear. It had produced few cars, and had cut absolutely no figure in the industry; but, as the Motor World pointed out at the time, it was possessed of the Van Wagoner patent which, as was stated, was supposed to have a considerable bearing on the electric vehicle industry, but efforts to learn more about the patent proved unavailing. For some reason, none of those interested were willing to impart information. Since then, however, the patent has been located and the search for it has served to bring out the statement that back of the Buffalo Electric Vehicle Co. stands the powerful General Electric Co., in whose control the Van Wagoner patent is alleged to repose. The statement lacks verification, however, all efforts in that direction having failed of their purpose.

The Van Wagoner patent itself proves to be an important one—so important that at one time other interests sought to obtain control of it, but inability to locate its owners put an end to the endeavor. When or how the Clark Motor Co., of Buffalo, secured it is not known, but as the patent is believed to control the shaft drive as it applies to electric vehicles, that it is likely to be brought to bear at any time is not denied. The patent is No. 671,036 and was granted April 2, 1901, to William Van Wagoner, by whom it was assigned to the Century Motor Vehicle Co., of that city, which produced steam cars but which long since gave up the ghost. It specifically covers a "drive mechanism for automobiles in which the power is applied to the axles of the rear wheels by a longitudinal shaft," and is made up of seven claims, as follows:

1. The combination of the carriage body, the running gear, a longitudinal shaft for driving the rear wheels, a motor frame connected with the front portion of said shaft, and a transverse pivotal connection by which the motor frame is connected to the carriage body, substantially as described.

2. The combination of the carriage body, the running gear, a longitudinal shaft for driving the rear wheels, a motor frame connected with the front portion of said shaft, and hangers which are connected with the car body by transverse pivots and to which the motor frame is connected by transverse pivots, substantially as described.

3. The combination of the carriage body, the running gear, a longitudinal shaft for driving the rear wheels, a motor frame connected with the front portion of said driving shaft by a longitudinally-movable connection, with a transverse pivotal connection by which said motor frame is connected with said carriage body, substantially as described.

4. The combination of the carriage body, the running gear, a longitudinal driving shaft, a casing for the same journaled at its rear end transversely on the rear portion of the running gear, a motor frame having a longitudinally-movable connection with the front end of said shaft-casing, and a transverse pivotal connection by which said motor frame is connected with said carriage body, substantially as described.

5. The combination of the carriage body, the running gear, a longitudinal driving shaft for driving the rear wheels, a motor frame connected with the body by a transverse pivotal connection, and a longitudinally-sliding and longitudinally-rotary connection by which the motor frame is connected with the front portion of the said shaft, substantially as described.

6. The combination of the carriage body, the running gear, a longitudinal driving shaft, a tubular casing for the same journaled at its rear end transversely on the rear portion of the running gear and provided with bearings at its rear and front ends, in which said shaft is journaled, a motor frame having a longitudinal bearing in which the front portion of said shaft-casing is capable of longitudinal and rotary movement, and a transverse pivotal connection by which the motor frame is connected with the carriage body, substantially as described.

7. The combination of the carriage body, the running gear, a longitudinal driving shaft provided with a gear wheel, a motor shaft provided with a driving pinion which meshes with said wheel, a gear casing enclosing said wheel and pinion, a tubular shaft casing extending from said gear-wheel casing rearwardly and journaled transversely on the rear portion of the running gear, a tubular shaft casing extending from said gear casing forwardly, a motor frame provided with a longitudinal bearing in which the front portion of said shaft casing is capable of longitudinal and rotary movement, and a transverse pivotal connection by which the motor frame is connected with the carriage body, substantially as described.

To Make Munsing Three-Wheel Tractors.

The Munsing Tractor Co., which has been incorporated under New York laws with $600,000 capital stock, has in view the production of the Munsing tractor, a three-wheeled vehicle which is specially designed to convert horse trucks into motor vehicles. It is characterized by a transmission having three speeds forward and three reverses, the reverse "being obtained on any forward or backward speed without using a hand lever and merely by pressing or releasing a pedal," the change of speed, according to the description, being "accomplished by simple clutches instead of sliding gears." Basil Magor, of 30 Church street, New York, who also is interested in the Magor Car Co., which purposes manufacturing railway cars, is the best known of the incorporators of the Munsing Tractor Co. Inquirers at Magor's office, however, are referred to M. E. Grey, an engineer located at 120 Liberty street, and Grey declares that he is so busy at this time that he cannot give any intimate information concerning the Munsing tractor or the Munsing company.

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THE MOTOR WORLD

PUBLISHED EVERY THURSDAY BY

The Motor World Publishing Company

1600 BROADWAY, NEW YORK, N. Y.

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Subscription, Per Annum (Postage Paid) $2.00
Single Copies (Postage Paid) . . . . . 10 Cents
Foreign and Canadian Subscriptions $3.00
Invariably in Advance.

Postage Stamps will be accepted in payment for subscriptions. Checks, Drafts and Money Orders should be made payable to The Motor World Publishing Co.

☞Change of advertisements is not guaranteed unless copy therefor is in hand on SATURDAY preceding the date of publication.

Contributions concerning any subject of automobile interest are invited and, if acceptable, will be paid for; or, if unavailable, will be returned provided they are accompanied by return postage.

Cable Address, "MOTORWORLD," NEW YORK.

Entered as second-class matter at the New York Post Office, November, 1900.

NEW YORK, JULY 25, 1912

UNSETTLING PRICES OF PATENTED PRODUCTIONS.

Having failed to induce his own committee to report his voluminous bill designed to revolutionize the patent system in vogue in this country, it is easy to understand that Chairman Oldfield, of the House Committee on Patents, should not be wholly happy. It is as easy to understand that to relieve at least a part of his unhappiness his colleagues should approve a much shorter and very much modified measure, particularly as the days of the present Congress are numbered, which makes appear that even the compromise bill will not progress to the enactment stage. It is more difficult to understand, however, why even a compromise measure should seek to make it unlawful for a manufacturer to fix the retail price of a patented article.

There is some justification for the Oldfield proposal prohibiting manufacturers from specifying particular materials or appliances in the operation of their patented devices. While the arguments against such a provision do not lack strength, the practice of so extending the scope of a patent that it may be made to include any or many unpatented materials or devices is fraught with far-reaching consequences, and though it is claimed to automatically regulate itself, it is, nevertheless, capable of serious abuse. There is justification also for the Oldfield proposal requiring owners of patents which shall have remained unworked for a period of five years to issue licenses to all applicants; for a dead patent is either valueless or is left unworked for ulterior purposes. But any effort to prevent the manufacturer of a patented article from fixing the price of his production is repugnant and is in the nature of robbing the patentee of the fruits of his ingenuity. It would serve considerably to upset the commercial practices of the world and would set many industries at sixes and sevens, for, despite arguments to the contrary, and when they are not in the nature of such general agreements as the law properly defines to be in restraint of trade, fixed retail prices for very many articles constitute a stabilizing and equalizing influence, the worth of which cannot be estimated. When values are unsettled chaos yawns.

While the same does not hold true of raw materials, there is no manufactured article covered by patents which is so essential to individual welfare that it must be purchased regardless of price, and there is no law or other force which compels any person to purchase any article, the price of which does not please him. For a period of seventeen years, the Federal law allows a patentee the right to do what he will with the fruit of his ingenuity, and while it may be wise for Congress to seek to prevent abuses which have grown up there is small wisdom in lessening the premium which the present law places on ingenuity; and the greatest of these premiums is the right to fix the price of the product of such ingenuity. It should remain the right and privilege of every patentee.

THROWING LIGHT ON THE GASOLENE UPLIFT.

Out of one of the mouthpieces of Wall Street has issued the statement that "fortunately," the Standard Oil Co., previous to the astounding rise in the price of its products, had in storage more than one hundred million barrels of crude oil, and "naturally is receiving great benefits from the higher prices," which, the Wall Street oracle fails to state, are of Standard Oil's own making and are wholly without precedent. It does state, however, that the current year is more than likely to prove one of the best in the history of the big corporation and also takes occasion to remark that the shares of the Standard Oil of New Jersey have appreciated to the value of more than $350,000,000 since the trust went through the motions of dissolving late last year; which is not at all strange, when it is recalled that the price of gasolene alone has been increased more than 75 per cent. in the course of six months.

The fact that the company was so farsighted as to be able to store more than one hundred million barrels of crude petroleum, seems to suggest the hiding place of those elusive sprites, Supply and Demand, who so regularly have been called to the assistance of Standard Oil since its prices started on their skyrocket career. While only the brave will dare fancy that the Standard Oil would be guilty of attempting to corner any considerable portion of the country's product, the wisdom and ability to store such a considerable portion of the country's production will strengthen the belief of many unknowing persons that the increase in price is largely of an artificial nature and that the automobile interests, among others, are merely being made to pay some fiddler, or fiddlers.

Why so many persons, not excepting some of those who manufacture the devices, will persist in applying the term "self-starter" to engine starters is one of the things past finding out. It is self-evident that the application is incorrect, and in the interests of proper terminology it would seem as easy to call an engine starter an engine starter as anything else. So-called "self-starters" do not start themselves, and that is not their purpose. They are designed to start engines.

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BENNETT ON HOT WEATHER WORK

Declares Summer the Season That Brings Out Real Salesmanship—Directions in Which to Expend Effort.

"This is the time of year that tests the qualities of a salesman," says George W. Bennett, vice-president of the Willys-Overland Co. "The salesman who is made of wax and melts with the heat and whose chief occupation consists of reading trade papers and who fans himself in the office shade and works only in cool weather is not made of the right stuff to sell motor cars.

"In these days of keen competition the salesman who does not work every minute will never succeed in anything. The hot summer months are the best season of the year for a salesman to get himself together, take account of stock and round up prospective buyers. A salesman who works with a vengeance through the summer should have his prospective buyer's notebook filled with names by the time the new models are announced.

"This is the right time for a city salesman to canvass his owners and ascertain how their cars are standing up, when they will be ready to take the new model, find a purchaser for the old car, get his customers' orders in to insure early delivery and see that the owner is being cared for in general.

"Many a sale is made by being 'Johnny-on-the-Job' during the hot season, and incidentally it means an increase in commissions and eventually promotion. I had rather have one man who can wade through his perspiration and make sales than fifty whose main thought in summer is the consumption of gin fizzes and a plunge in the surf."

Oldfield Drafts Compromise Patent Bill.

Although he has abandoned hope for his bill, which sought to revolutionize the patent system of this country, Congressman Oldfield of the House Committee on Patents finally has induced his committee to report favorably a compromise measure which embodies these three principal and drastic provisions:

Making it unlawful for manufacturers of a patented article to fix the price at which it is to be sold to the consumer by the retail merchants.

Prohibiting manufacturers from requiring the use of specified materials in the operation of patented devices.

Requiring patentees to issue licenses to applicants for the manufacture of any article covered by patents which shall not have been "worked" for a period of five years.

Even the favorable report of the Committee on Patents, however, does not assure the passage of the new measure, but Mr. Oldfield hopes to bring sufficient pressure on the Committee on Rules to induce it to place his bill on the calendar for disposition before the adjournment of congress.

Making the Repair Shop Attractive.

'Way down South in New Orleans, the Chalmers Motor Car Co. of Louisiana has found a way of making even a repair shop attractive. The attraction consists of Miss "Jack" Gray, aged 18, who is one of the company's "repairmen." She has been employed in the Louisiana Chalmers service department as a mechanic's helper for some three months, and, although she



MISS "JACK" GRAY—MECHANIC'S HELPER

wears "pants" she is nevertheless attractive, as the accompanying photograph serves to show. Manager Cummings, of the Chalmers Motor Co., adds that "she is as capable as a man in a similar position. What her idea is in learning the business we do not know," adds Cummings, "but she is enthusiastic about her work and seems to enjoy it."

Willys Details Output of Overlands.

For the first time, so far as known, one of the prominent manufacturers identified with the automobile industry has made public a detailed statement of his output. He is John N. Willys, president of the Willys-Overland Co., whose fiscal year ends July 31st and whose 1912 production already has been shipped from the factory. Instead of dealing with convenient round figures, Willys gives the number of cars to the last one as they were shipped each month, the record being as follows: August, 1911, 284 cars; September, 869; October, 1,472; November, 1,851; December, 1,588; January, 1912, 1,826; February, 2,201; March, 2,960; April, 3,011; May, 2,605; June, 1,591; July, 539, a total of 21,788. Although there is no reason to doubt the correctness of the figures, Vice-President Bennett of the Willys-Overland Co. states that the order books of the concern are open for inspection of doubters. For 1913, the Willys-Overland output will approximate 40,000 cars.



July 22-28, Dallas, Texas—Farm and Ranch Tour under the auspices of the Dallas Automobile Club.

July 24-31, Minneapolis, Minn.—Reliability tour of the Minnesota State Automobile Association.

July 27, Rochester, N. Y.—Track races under the auspices of E. A. Moross.

July 27, Wilkesbarre, Pa.—Track races under the auspices of E. A. Cusick.

July 27, Grand Rapids, Mich.—Track races promoted by the Grand Rapids Automobile Club.

August 1-3, Memphis, Tenn.—Fourth annual reliability run of the Memphis Automobile Trade Association.

August 8-9, Chicago, Ill.—Trade vs Amateur drivers' reliability run, promoted by the Chicago Motor Club.

August 8-10, Galveston, Texas—Beach races under the auspices of the Galveston Automobile Club.

August 24, Uniontown, Pa.—Hill climb under the auspices of the Automobile Club fo Fayette County.

September 2, Washington, D. C.—Motor truck parade conducted by the Washington Post.

September 2-3, Indianapolis, Ind.—Races on the Motor Speedway, promoted by the Indianapolis Motor Speedway Co.

September 7, Hadine, Minn.—Track races promoted by the Minnesota State Fair Association.

September 17, Milwaukee, Wis.—Grand Prize road race under the auspices of the Milwaukee Automobile Dealers' Association.

September 21, Milwaukee, Wis.—Vanderbilt Cup race on the Greenfield course, under the auspices of the Milwaukee Automobile Dealers' Association.

October 7-11, Chicago, Ill.—Chicago Motor Club's reliability run.

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THE STATUS OF THE CHAUFFEUR

His Relation to the Trade and Usefulness to Experts Defined by a Caustic Observer—Service Stations and Replacement Depots Examples.

"It seems to me that the position of the chauffeur in the trade never has been correctly fixed," remarked a "professor" in one of the many "automobile schools" which turn out chauffeurs almost while they wait. The "professor" is a bright chap, and when he spoke was in a more or less ironical mood.

"Of course," he continued, "we have read a lot about the influence for good or ill which the chauffeur has on the sale of trucks and on the upkeep of cars and trucks generally, and we all know that there is more or less truth in all that has been said on the subject; but that sort of thing does not fix the chauffeur's status in the industry; for, if anyone cares to tell the whole truth, the chauffeur is the 'goat' for the whole trade; that's his position. If he did not exist, it would be a sorry day for not a few dealers and salesmen, and for nearly as many so-called experts. If you do not believe it, you can obtain enlightenment almost any day by taking your car to any one of a dozen service stations or other places where experts make a good living by putting things in order and generally straightening out kinks that may have developed.

"Broadly speaking, it makes no difference whether the expert has to do with engines, or magnetos, or carburetters, or speedometers, it is always the same: no fault ever attaches to any of the various devices, even though the expert may have 'looked them over' the day before. Always the chauffeur is to blame—he has 'monkeyed' with them, or has adjusted them improperly, or failed to adjust them, or in some way or other has put them out of whack. The opinion of the experts on this point would be startling if it were not so unanimous. They've got to put the blame on someone, and the poor old chauffeur rarely fails to get it. He's the trade 'goat,' if ever there was one. He is blamed either first or last where he is not blamed all the time."

"And, say!" ejaculated the "professor," as another thought struck him, "whenever you desire to see something else that is illuminating, just drop into a few of those service stations or tire replacement depots, and you will discover the real reasons for some other things that occasionally cause wonder on the part of car owners. In many of those places, the chauffeur appears to be considered more or less of a joke, who must be tolerated, and that's about all. The treatment that often is accorded him is enough to make a man's blood boil. While no one expects him to be handled with kid gloves, or expects to find such establishments sprinkled with rose-water, the curt answers received from underlings and the long waits he is compelled to suffer constitute what I suppose some people would call a crying shame, but which, in my opinion, is a shame that properly can be expressed only by a much stronger word.

"There is one carburetter service station in New York where the chauffeurs are told that they will be given no attention, unless they bring their cars there between 8.30 and 9 in the morning. If your imagination is good, you know what that means. There are other places where they are kept waiting in line for hours, and where the slightest insistence on their part merely begets insults. Only to-day I heard one owner remark that until he himself had visited an establishment of the sort he several times had been given cause for wonder where his chauffeur killed time when sent to such places. His visit apparently removed the doubts and suspicions which had arisen in his mind.

"About the greatest satisfaction that the chauffeur obtains is when an owner drops into an establishment of the kind. The 'experts' and understudies are so accustomed to dealing with chauffeurs that they fancy that everyone who enters the place is a professional driver, and they treat him accordingly. I happened to be in a tire replacement institution not long ago when one of the understudies made a mistake of the sort. He treated the car owner—a man of means—as he was accustomed to treat chauffeurs, and, believe me, the dressing down he received will probably last him for a while. It brought joy to all the chauffeurs who happened to be within hearing.

"There is more trade 'queered' by treatment dealt out in such places than the proprietors of the establishments imagine is the case, and, take it from me, it wouldn't be a half bad idea if a manager, or someone else in authority, occasionally put on his gum shoes and otherwise disguised himself and dropped into his service station or replacement depot and kept his eyes and his ears open for at least a few minutes. He might learn why some people with whom he once did business now go elsewhere with their patronage and why the number of new trade acquisitions does not mount up rapidly."

One Way of Emphasizing Guarantees.

Some salesmen are equal to almost any emergency and do not spare the "other car" when occasion requires.

"But the Blank car is guaranteed for life," protested a prospective purchaser to a salesman of the sort.

"Yes, I know it is," retorted the quick-witted salesman, "but our car is guaranteed for a whole year."

It required several moments for the prospective purchaser to see the point.

THE BEST BUY WHAT AND WHY

Is There a Car Which Ranks Supreme as a "Money's Worth"? Problems Which Perplexed One Buyer—The Dealer's Opionion.

It was a big day in the family of the Young Attorney, for they were going to have an automobile. The head of the establishment long had talked with other members of the family over the gasolene cars which were owned by so many other attorneys and business men, while for years—it seemed years—the rising barrister had been forced to content himself with travel in electric vehicles—most of them were owned by the Interborough Rapid Transit Co. and other public service corporations.

The family had decided that with a comfortable bank balance and a practice more remunerative than it once had been, an automobile would not be an extravagance; the price, of course, they considered; for a car such as he had pictured would cost $3,500 or $4,000. Just what make had not been decided upon, and they were, in fact, further from that decision than ever. A multiplicity of catalogs had served only to confuse, so, relieved by a happy idea, the Young Attorney journeyed uptown from his office one Saturday afternoon to consult a friend in the trade who, he was sure, would put him right, even if it meant the loss of a sale.

"It's like this," he explained. "I want you to help me out as a friend and not talk to me as an agent for a car. If necessary, I'll make the threat right now that I won't buy one of your cars, anyway, so whatever you say for it doesn't count."

"What's your idea of a car—price, and so forth?"

"Well, I've been waiting a long time until I could afford to buy a car, and I want a good one; I don't want a cheap car, but I don't want to pay more than I have to. I want what some of you gentlemen have been known to term the 'best buy in the market.'"

"That situation opens great possibilities," commented the dealer, "for there is a greater variety of opinion as to the 'best buy' than on any other subject I know of."

"Yes," remarked the Young Attorney rather sarcastically, "I have gathered as much from reading about three bushels of catalogs and other literature and talking with several score of dealers. So far as I can find, everyone is right, no one is wrong and every car is the best car. But what I want from you is information as to what you call the best car to be had for the money."

"The first part of your statement may not be so far from wrong, and perhaps

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most of the men you talked with are right. I wouldn't say this to anyone but you, and if you have any regard for our friendship, please don't repeat it."

"That's right," said the attorney, smiling; "I'm pleased to hear you admit your car isn't the 'best car.'"

"I admit nothing of the sort. There isn't any best car, in my estimation."

"What! No car that ranks supreme?"

"I mean, no car that is so much better than any other—considering the price it sells for."

"Well, queried the legal man, "what car, then, ought I to buy?"

"That depends on your circumstances—what your income is, what you want to pay as purchase price and what you can afford to pay for running expenses. Some years ago there were cars that had forged to the front in certain perfections until they might be considered 'best buys' compared with other cars of any price; but with things as they are to-day conditions have changed. There are some cars now that I wouldn't take as a gift and pay for their upkeep, but a man is safe with most any car. It's a whole lot like shoes, for instance. You probably pay about six dollars for your shoes, but you know well enough that you could pay half that price and get a pair of shoes that would last as long or nearly as long as those you buy now, and half the people you meet wouldn't know the difference. You buy them because you know they are good shoes and have 'class.'

"Then, take horse-drawn carriages. You can pay all prices for them, but you know that any carriage which is not ashamed of its maker's name will run and give pretty good service. Of course, it may not have the 'class,' comfort and equipment that goes with the highest priced rigs, but for a man who doesn't want to pay the big purchase price it will do very well. You could have bought a car long ago and not been extravagant. I knew you wanted one, but I let you alone, because if I influenced you into buying one I knew you would not take one of mine, because all my line is included in the so-called high-priced list. I don't propose to fix the salary at which a man can afford a car, but I do say a man doesn't have to be a millionaire to own one. The business or professional man of average means, if he can be satisfied with a lower priced automobile, can afford one. In almost every car you buy to-day you get your money's worth."

"Do you mean to say," said the attorney, who had been listening open mouthed, "that a $500 car will run as long as a $5,000 car and give the same service?"

"Not exactly that. You take the cars that sell for less than $1,000, for instance. There are parts of the car that don't get the careful finish that the costly car does, and there are details to which the attention is not paid; the upholstery may not be as deep and the reserve power may not be as great, but they run. The outside of the water-jackets may not look as pretty as that on the other car, but what needs to be reliable to ensure satisfactory work on the road is generally well taken care of. On the higher priced cars you can get any color you want, but there may be a lower-priced manufacturer who keeps his expenses down by adhering to a line of standard colors, and you have to take what is offered; but you nevertheless get a car that will permit you to take your Sunday runs into the country and you get a lot of enjoyment.

"Now, you may not want a car like that. You may have your heart set on something with more refinement and a little more power; in that case you run up the scale a few hundred dollars and you find it. The equipment may be more complete, but full equipment on all grades is fairly common to-day. Of course, the quality of equipment may vary. The finish is better as you go higher and the motors are likely to afford more power—and, too, that means more gasolene. You can grade yourself up by the hundred dollars and find a car at almost any price—and get satisfaction.

"Some men have a great desire for a 'six,' and there is no question of its desirability, the great flexibility and smoothness of running; but you won't find the 'sixes' appearing until you get up in the neighborhood of $2,000. Then you can begin to grade the 'sixes' the same as you did the 'fours.' When you look around in the factories where the cars are made which sell around $3,000 you will find them getting more paint and varnish, with rubbings which give a better finish. The lower-priced cars can't have this, because it would mean so much more on the purchase price, and the man who gets that kind of car does not expect to pay for things he does not really need—and on his Sunday outings he can drive just as well as if the car was striped with goldleaf.

"The cars which are top notchers in price are also, generally, top notchers in every detail. They have more power, they are marked by greater attention to details and by greater regard for luxury, and it is in that class that you find the 'classiest' limousines and town cars. There is every reason why these cars should afford more comfort and last longer, and though it does not always hold true, there is every reason why you should be better taken care of after you've bought the car; the price permits it.

"One of the best arguments for what I have said is on the street right here in front of this store. Take a look: There comes a car that sells for $600 or $700. Doesn't it run all right? There's one for $5,000. That runs, too, but a blind man with a few feels could tell the difference if he could rub his hands over the two. There are three or four that sell from $1,000 to $2,000, and while we have been watching there have been quite a few that sell in the low-high-priced class. You see for yourself that all of these cars run and their owners appear satisfied. Why? Because they've got their money's worth. I don't mean that every car is good, for there are some which are notorious trouble-makers.

"That man in the $600 car will be making more money in a few years, and he will also have gotten his money's worth out of his little car, so he will trade it in or sell it and get one a little better. As he keeps rising financially he will keep getting higher-priced cars, for most people grade their ability to own a car on the first cost. Now, you have denied yourself a car until you can afford the best one. There are lots of cars that will give you satisfaction as well as mine, and mine will give you as good satisfaction as any of the others. Besides, we have a few little features on our car that some of the other fellows seem to have overlooked."

"That's right, now, try to sell me a car," interrupted the Young Attorney, but without bitterness.

"Well, you're going to pay for a car just as much as one of mine costs, aren't you?"

"There may be a whole lot in what you say, and if it is true I feel like a chump for having been without a car so long. All I longed for was something that would go and would be big enough to carry my family, and, believe me, I would have been no stickler for finish; but now I want one that has real 'class.' You see, the senior member of our firm has——"

"Sure, I know," laughed the dealer, "you're in the 'class' class and you want a 'class' car—and, O say, I almost forgot, but we have a great service department here, we take care of you properly after you get the car and——"

"I guess you needn't say any more. I take back my threat about not buying one of your cars. Had I gotten this advice some time ago I might have had a lot of pleasure and bought one of your cars in the end, so I suppose I might as well buy it now. When I came up here I had no idea what you would say, but I determined to take your advice for what it was worth. I supposed you'd recommend some particular car or——"

"I did, didn't I?" said the dealer, smiling, and it really was his turn to smile.

Garage Dampness that Promotes Rust.

Though it is practically impossible in public garages to be rid of a certain amount of dampness because of the activities of the washer, conditions in private garages where no washing is done are different, and if proper precautions are taken to open windows and doors after a car that has been driven in the rain has been housed the effects will be beneficial. It scarcely is necessary to point out that dampness causes rust and tarnishes the bright work. Therefore, if the garage is kept as dry as possible, care being taken to air it out occasionally, less application of "elbow grease" to the brass will be necessary and rust will not attack the iron and steel parts.

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RETAIL FIELD VIEWED THROUGH A NIGHT GLASS

The Practice of Keeping "Open House" After Dark That From an Insignificant Beginning Gradually Has Become a Habit—Its Good and Its Poor Features Laid Bare By Several Prominent Dealers—The Ultimate Influence That Is Bad.

It cannot be denied that there are certain phases in the selling of automobiles that are peculiar to that business and to it alone. While it is perfectly true that the automobile rapidly is coming to be viewed in the light of a necessity by a certain gradually increasing number of persons whose ideas of luxury as engendered by the possession of what has been expressed as "piles of filthy lucre," turn more readily to private yachts, for instance, or to aeronautics, or anything else that is more expensive, simply for the reason that it is more expensive and the glamor of the possession of one or more motor cars has partly worn away, the fact remains that in the majority of cases the automobile, and particularly the moderate-priced automobile, still represents a luxury to the average purchaser.

And as such it requires a high class of salesmanship and methods that, while resembling those that apply to the sale of other staples, are not quite akin to any of them. Necessities sell themselves, and though articles which may or may not be viewed in the same light may also sell themselves to a certain extent, their disposal as often as not entails a careful "handling" of the "prospect," perhaps in order to create the feeling that the article is, after all, a necessity, but in any case it is necessary first to obtain the good will of the intending purchaser—to make him "feel good," in other words. After that it should be plain sailing for the salesman, provided, of course, that he has the goods to sell.

Naturally, there are any number of ways in which a salesman can make the impression which must precede the actual sale: The article he is selling may do it for him; or he may, by the artful use of words, work up his prospect to the pitch of enthusiasm where he virtually sells the article to himself; and, last but not least, he may place himself in the background, efface himself, so to speak, place his whole time and pleasure and efforts at the disposal of the intending purchaser. Of course, the last measure often entails hardship and requires that a salesman devote time to the sale of his products which otherwise would be spent in the pursuit of pleasure or in the bosom of his family.

And the retail automobile business is peculiar in this respect: It often is necessary, by reason of the business interests of the intending purchaser, that appointments or demonstrations be arranged to take place after the close of what generally are considered to be business hours. Of course, the intending purchaser of an automobile knows, as well as the intending purchaser of any staple knows, that the salesman who is keen to dispose of his wares will not object to a little overtime work, and consequently he is not averse to making evening appointments even where it is possible for him to transact the business during the day. The salesman, on his part, is willing that this should be so. It is one way of creating an impression, of obliging the "prospect" and of giving him a sense of his own importance in the transaction.

And though it undoubtedly has been the desire on the part of agents to increase the amount of business done that has prompted the practice of keeping "open house" almost until the "wee sma' hours" of the morning, it has been the feeling back of it all to oblige the customer that has been responsible for the movement. But whether the practice of keeping salesrooms open in the evening really is good for the business, or, in other words, if it really pays, if viewed from every angle, is largely a matter of opinion. Of course, conditions vary according to the size and the location of the city which harbors the salesroom. In a small city, for instance, where the salesroom is located on the main thoroughfare along which crowds of persons on pleasure or business bent wend their way at night, keeping the salesroom open at night might pay handsomely; on the other hand, it might not do so, much depending on the temperament of the natives.

On Broadway, in New York City, where are located most of the principal automobile salesrooms, however, it is the concensus of opinion among those who do not close their doors promptly at half-past five or six in the evening, that keeping open pays, though, strangely enough, it is pointed out by more than one manager that the practice is bad for the business in the end. All express a desire to get out of the habit, though it is admitted that it is practically impossible to do so, without considerably decreasing the amount of business done, for the simple reason that it has become a habit and the automobile purchasing public has become accustomed to it.

C. T. Silver, of the C. T. Silver Motor Co., which distributes Overland cars in the Metropolitan district and environs, modestly claims the credit, or the discredit, of having inaugurated the practice, and is one of those who has no hesitancy in wishing it might be stopped. His salesroom on Broadway is open every evening until midnight.

"If it did not pay to keep open in the evenings we would not do it," Silver sums it up, "and neither would anyone else. We have five salesmen here, and it is the duty of each to take his turn at night duty. As he does not have to report the next day until one o'clock, it is not very hard on him, and anyway no salesman works very hard when he does work. If we sold three cars in a year by keeping open in the evenings we would consider that it paid, for it costs nothing to keep open. As it is, we sell more than three cars, and, besides, it is good advertising. Persons drop in here after the theater to look over the line, or to get a catalog, or to ask any of the innumerable and foolish questions that enter their minds, and in a great many cases we get real live "leads" which later can be closed up. Yes, it pays, all right, but it is bad business, for it lowers somewhat the dignity of the salesman in that it gives an appearance of servility which, as a rule, they do not like. The salesmen themselves want to abandon it, but that is nothing out of the ordinary, for every salesman seems obsessed with the idea that his own pleasure ought to take preference over his business interests and, as I already have said, none of them ever work as hard as they might, despite the fact that it manifestly is to their own good to do so. Personally, I wish we could quit keeping open, but we can't; and there you are."

W. B. Raymond, who is sales manager for the Abbott Motor Co. of New York, which handles Abbott-Detroit and Regal cars, has even more pronounced views on the subject and goes so far as to say positively that in his experience it is a very bad thing for the business.

"When you consider," he says, "that the average automobile salesman is nothing more than a slave who works 365 days in the year—vacations are practically impossible for the reason that if you leave your 'prospects' you get out of touch with them almost immediately and someone else snatches them—it is pretty hard on him to expect him to do night duty as well as day duty. Double work naturally impairs his efficiency as a salesman, and there is no doubt in my mind but that in the end we lose out. Here, in the evening, we get some mighty good leads, and in a number of cases perfect strangers have strolled in, and before they got out we had a signed contract in our possession. The persons

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who drop in here in the evenings are much the same as those who come in during the day, the only difference being that in the evening we are less likely to be interrupted by the telephone or by 'kicks,' and we have a better chance to get close to 'prospects.' We did not start the practice with the idea of catching 'floaters.' It was started entirely by accident. Some of the boys got into the habit of dropping in here in the evening to smoke and 'chew the rag,' and as soon as it became known that some one was here theatergoers and others commenced to drop in, and before we knew it the habit had grown. Now we have to keep a man here every night, though it is good in one way. As each salesman is required to make out a certain number of reports and has a certain amount of office work to do every week, we have arranged it so that he can do it on the night he is on duty. In this way he can kill two birds with one stone. But on the whole, this keeping open in the evenings is bad business, and I am going to stop it next week. But I am going to commence it again just as soon as the new models arrive."

As expressed by one of the salesmen at the Buick agency, the practice is good—for the salesmen. "For," he explained, "as we work on a commission basis, we don't mind staying here one night a week, and whatever we get out of it is virtually 'velvet.' At present it is pretty slow in the evenings, but we have sold all our allotment and we don't mind it very much, for any persons who come in are immediately made 'prospects' for the new models. As soon as we get the new cars there will be a lot of 'velvet' distributed, too, if we can judge by the number of cars we have sold 'after hours' in the past." At the Oakland agency much the same view of the situation is taken, one of the floor salesmen explaining that "though a lot of live 'prospects' come in during the evening and night business had been pretty brisk of late, it was 'terrible' hard on the salesmen, who one night each week are required to be on duty from eight in the morning until midnight."

Over in Brooklyn, which by reason of its proximity to Long Island points and the position of its automobile row virtually in the path of all the cars en route to Coney Island and other resorts, rapidly is assuming to considerable prominence as an automobile distributing center, conditions are practically the same as they are in New York City proper, the only exception being that, if anything, the practice of keeping salesrooms open in the evening is more general than it is across the East River. After nightfall, Bedford avenue becomes a veritable blaze of glory, and there are few with designs on the ownership of a car who can resist the appeal of the brightly illuminated salesrooms. And invariably those who hesitate are lost, that being the phraseology adopted by Louis Burstein in discussing the matter with the Motor World man. Burstein is the treasurer of the Tanner Motor Car Co., which has the distributing agency for Everitt and Oldsmobile cars on Long Island. His salesroom is kept open every night "till the last customer has left," no set closing time being the order.

"Of course it pays," said Burstein, reiterating what C. T. Silver had said, "or we would not keep open. I believe that the salesroom where moderate-priced cars are sold should by all means be kept open in the evenings, for the purchaser of a moderate-priced car generally has a moderately strenuous time filling his pocketbook in daylight hours and cannot afford to take time enough from his business to examine a car and make up his mind to purchase it. We have had several men drop in here through the day for a catalog, and have made appointments with them for an evening demonstration and sold them cars at night. If we had refused to do business at night we would have been out of pocket. That's all there is to it. Time and again I have had men with their wives drop in here in the evening, presumably after the theater, just to look over the line, and before you know it I would have them signed up. If the agency had not been open we might have gotten the business in the day time, but then again someone else who does keep open at night might have gotten it, for the reason that the man of the house could not get around during his business hours. And that explains the situation in a nutshell: If one agency keeps its doors open in the evenings then they have all got to do it, or the one who remains open will get the business. I wish I did not have to keep open at night, but it has become a habit—everyone in Brooklyn knows that the Tanner Motor Car Co. keeps open house in the evenings—and we just can't shake it off. Still, on second thought, I don't know whether I would want to do so, after all; for we are doing a good business here nights that we might lose otherwise." "Another thing," he added, "it is good advertising for us to be open at night, but the minute we close the doors, whether it is eight o'clock or midnight, the lights go out, for it does not do a bit of good to pay electric light bills just to let people look through the windows at the cars. The day has passed when you sell a car that way—on looks—and the sale of a car to-day requires that a man be right on the job to 'sell' the car, and, if necessary, to hold the pen that signs the contract."

Whether the practice of keeping automobile salesrooms open during part of the night actually pays in the long run or not, there is no such uncertainty regarding the remuneration of the night-blooming variety of supply store, in the mind of J. H. Parsons, who for the past six years has been located in the heart of the automobile district on Broadway in New York City. Despite the fact that his sign reads "Talk with Parsons, day and night," which might lead to the supposition that the store was kept open all night, it is closed at about 10 o'clock, which is, as Parsons put it, "plenty long enough."

"Frankly, it does not pay me to keep open," he said. "I may take in anywhere from one to five dollars a night—last night I took in $2.30—but that is not a drop in the bucket. Why, then, do I keep open? Well, the truth of the matter is I have nowhere else to go, and if I stay here I catch whatever business there is floating around, and it keeps me out of mischief. "But it does not pay," he added, with faint pathos, "and any man who thinks it can be made to pay is a fool, for I have been at it a long time and I know whereof I speak."

Hot Water for Removal of Carbon.

Carbon removal is one of those necessary things which must be attended to every now and then if the best of results are expected. The motor need not be taken down, however, save in cases of very heavy deposit, which cannot be removed without scraping. For most deposits the use of a carbon removing chain or solution, several of which are on the market, will help considerably. The injection of "simple hot water," according to a gas engine machinist of no mean experience, is, however, the best method of removing carbon yet devised. The motor is warmed up, and then run light at high speed. The warm water is poured into the auxiliary air inlet of the carburetter until the motor begins to "choke." Several applications, he declares, will suffice to flake off the carbon, even in aggravated cases. It goes without saying that, immediately after the hot water treatment, oil should be applied to prevent the formation of rust.

Celluloid to Illustrate Body Colors.

Making use of a scheme that at one time was in more or less general use by such plebian persons as tailors, at least one automobile sales agency has adopted a novel though not new method of illustrating to prospective purchasers the effect of different finishes on its various models. The necessary apparatus consists of several sheets of clear celluloid upon which is printed in black the outline of the various models. By placing the celluloid over the color specimens, it is possible to judge at a glance and generally with entire satisfaction the ultimate effect that would be obtained if the car were finished in that color. In some cases the scheme is rendered more effective by gilding the celluloid to represent the parts which ordinarily are polished brass.

Filler Caps Broken by License Tags.

It is bad practice to fasten a license tag to the radiator filler, unless the lower portion of the tag is braced against the radiator frame. A very slight knock on the lower end of the tag is liable to tear the base of the filler from its fastening on the top of the radiator, owing to the leverage through which the force acts.

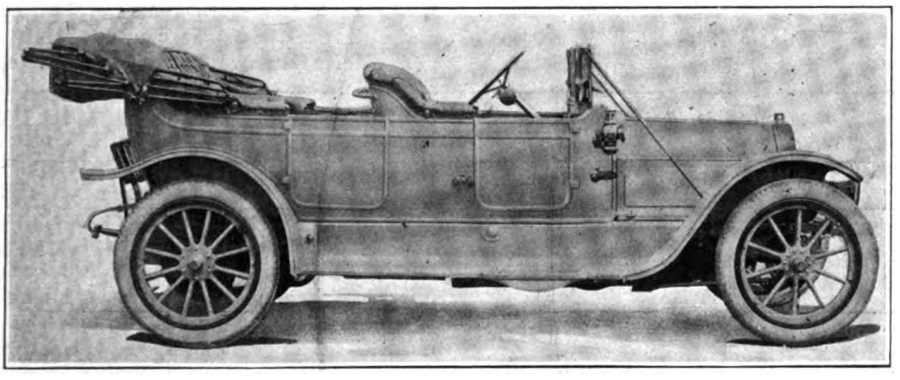
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PIERCE MAKES TWO DEPARTURES

Adopts Tubular Drive Shaft and Force-Feed Lubrication—Also Employs Air Starter and Westinghouse Lighter.

Always distinctive by reason of beauty of outline and finish that has served as an infallible indication of their A1 material and superb workmanship, Pierce-Arrow cars of the newer series—the series that embodies the refinements and the slight alterations that experience with previous models has suggested—have been made more than ever the exemplification of all that is right and proper in automobile construction.

As heretofore, there are three motor sizes in the line, though the designation of the corresponding cars has been altered to permit of the elimination of all reference to the year of their make, letters being substituted, merely for factory listing purposes, it is explained, and to them are prefixed numerals which indicate the horsepower of the various models. Thus, for instance, there are the 66A, the 48B, the 38C and the 48D, the last named being a new model as regards the body and equipment, though the chassis differs little from the standard 48-horsepower car. All are equipped with six-cylinder motors, as they have been since 1908, when their manufacturers, the Pierce-Arrow Motor Car Co., of Buffalo, N. Y., put all its eggs in one basket, so to speak, and discontinued the manufacture of "fours."



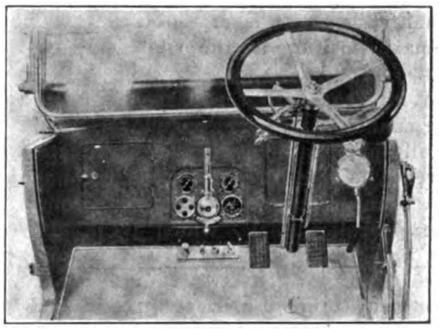
PIERCE-ARROW MODEL 38C—A FIVE-PASSENGER TOURING CAR

Though radical changes in design are not looked for in the products of the Pierce-Arrow company, several alterations nevertheless have been made, which in view of the consistent continuance of well-tried features for a number of years almost might be termed radical without danger of straining the meaning of the word, at least as applied to Pierce-Arrow cars. Thus, for instance, the gravity feed lubrication system which has been one of their distinguishing marks, and which over a long term of years has given service the satisfaction of which has been indicated by its continued use, has been replaced by a force-feed system, in which the oil is forced under pressure to every main and auxiliary bearing. The other alteration of an epochal nature which has been made, and it is noteworthy that there have been only two, is the substitution of a tubular propeller shaft for the solid shaft that has been used in the past.

Such other alterations as have been made are largely in the nature of additions to the equipment and do not affect the general design or construction. Perhaps the two most important changes in equipment are embraced in the addition of a complete dynamo electric lighting system to all the models and the addition of a compressed air engine starting system to all except the model 48D which is fitted with an acetylene priming device. In other respects, the equipment is unusually complete, as becomes the products of a manufacturer that always have been marked by extreme liberality, and includes windshield with patent ventilators, Pierce-Arrow demountable rims with two extra rims, electric head, side, tail and dash lamps, Warner speedometer and clock, gasolene tank gauge, gasolene primer, power tire pump, Klaxon and bulb horns, shock absorbers, trunk rack, foot rests, coat rails, tools, spare parts, and so forth. Despite the amplification of the equipment, however, the prices of the various models remain unchanged, with the exception that the 38-horsepower model now lists at $4,300 instead of $4,000. The 66A, in seven-passenger touring form, lists at $6,000, and both the 48-horsepower models list at $5,000. The prices for models 48B and 66A in limousine and landaulet form are the same—namely, $6,100 for the former body and $7,100 for the latter, the same prices applying to the suburban and landau types; the vestibule suburban and landau list at $6,300 in model 48B and $7,300 in model 66A.

Except for the fact that the stroke of the 38-horsepower motor has been increased from 5⅛ inches to 5½ inches, the bore being 4 inches, motor sizes remain the same, the cylinders of the 48- and 66-horsepower models measuring 4½ x 5½ and 5 x 7, bore and stroke, respectively. Treating all the motors as mechanical duplicates with respect to their design, the most noteworthy alteration which has been made concerns the oiling system, which, as has been pointed out, is brand new. Under the new regime, the oil is circulated through a hollow crankshaft by means of a gear-driven pump, the lubricant being delivered to a manifold in the crank chamber, whence it is led by means of suitable ducts to the main bearings and to the timing gear train. By means of pipes along the connecting rods, the oil is led to the wrist pins, thus providing them with a separate and positive feed. The engine starter, as may be seen by the picture, is of the orthodox type, in which the component parts are a four-cylinder compressor driven from the forward end of the change gear mechanism, a reservoir, a distributer, which is driven from the camshaft, and a conveniently located pedal valve. Incidentally, provision is made for inflating tires from the reservoir.

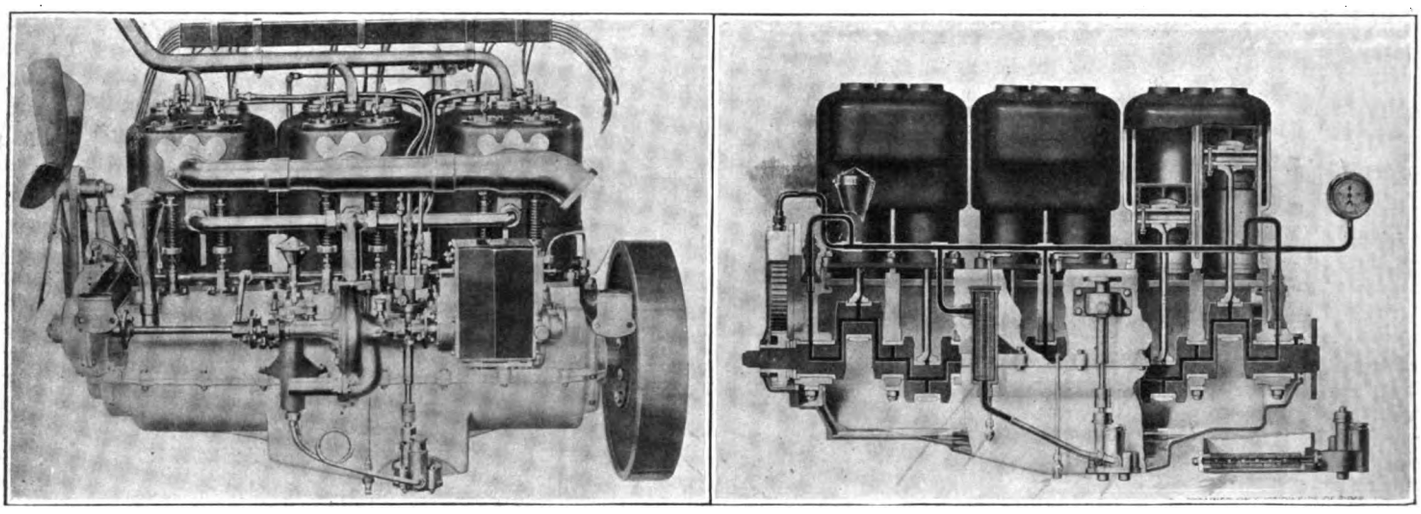
In working out the method of ignition, no inclination to place entire dependence on any single system has been shown. Instead, a Bosch high tension magneto system with variable advance is supplemented by a master vibrator and coil system operated by means of a storage battery. The magneto is located on the left side of the engine, and the shaft which drives it serves also to drive the lighting dynamo. The dynamo itself is of Westinghouse manufacture and forms the principal unit in the recently perfected Westinghouse system with which all the cars are equipped. Current supplied by the dynamo during the time the engine is running is stored in an accumulator of liberal capacity, the system being completed by the addition of the usual switches and automatic cut-out, the purpose of the latter being to prevent the storage battery discharging itself through the dynamo when the engine is idle.



CENTRALIZED CONTROL SYSTEM

In connection with the arrangement of the dash apparatus, particular attention has been given the centralization of control, and to this end the various electric, air pressure and oil pressure gauges, together with the necessary valves and control elements have been placed on a central panel almost directly under the driver's eye. In order to facilitate operation of the car at

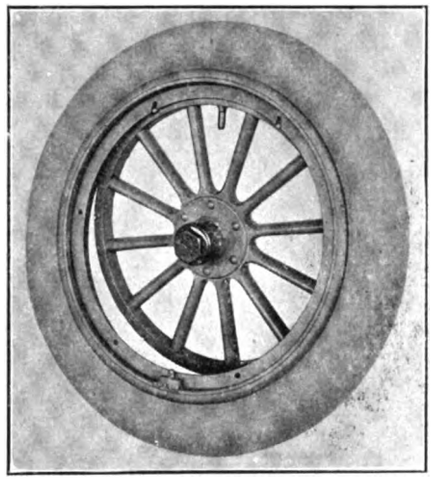
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TWO VIEWS OF THE PIERCE-ARROW MOTOR, SHOWING DYNAMO POSITION AND NEW OILING SYSTEM

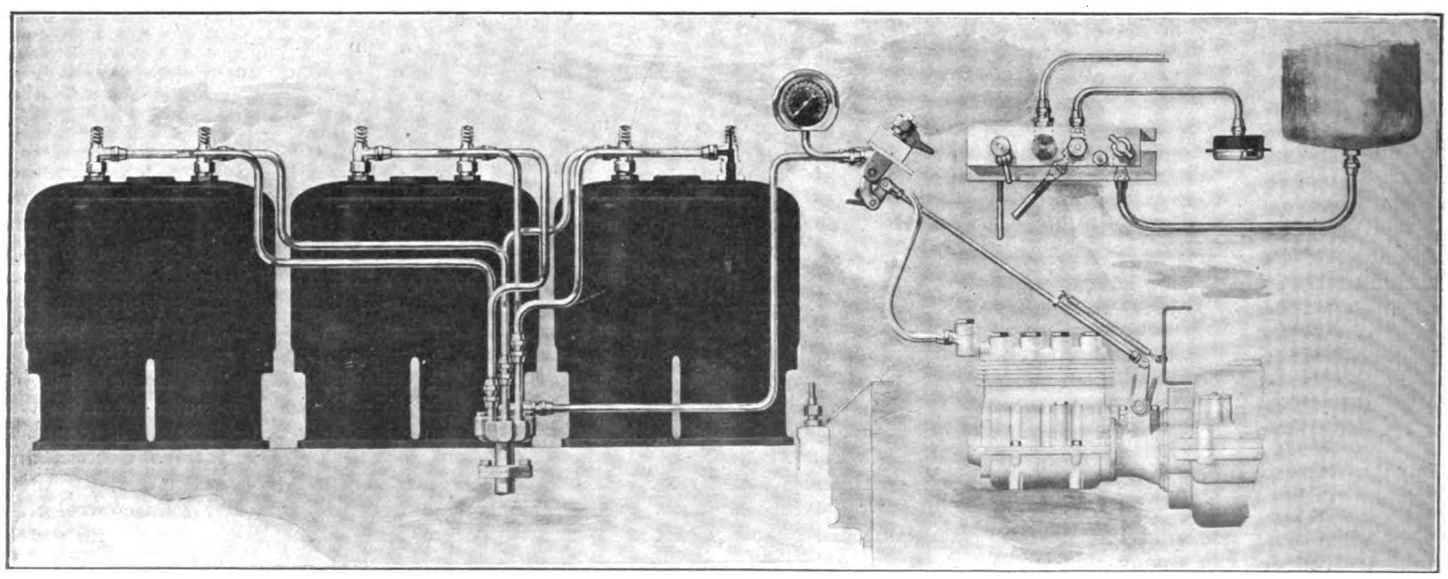
night, the panel is illuminated by means of an electric light carefully located and shaded to obviate the possibility of the glare detracting the driver's attention or otherwise disturbing him. The remainder of the control elements—that is to say, the steering wheel and the gear shaft and emergency brake levers—occupy their customary position at the right side of the car.

With regard to the chassis proper and the running gear—the four models are practically identical except for a legitimate difference in size of parts—the most important change which has been made concerns the propeller shaft, which is tubular in section. In explanation of the reason for the change, which is a radical departure from any other American practice and is exclusive with the Pierce-Arrow cars, it is pointed out that the new construction permits at once more rigid and less weighty construction, the ultimate effect being to increase the already high factor of safety which always has been allowed throughout the cars. The change, of course, has necessitated other changes to conform to the new construction, and these include the adoption of new universal joints of somewhat greater bearing surface and a slight rearrangement of the rear axle housing to make room for larger and more substantial driving and differential gears. Another important advantage which the tubular propeller shaft has is that its bore forms a convenient method of insuring the constant and efficient lubrication of the rear construction.



PIERCE-ARROW DEMOUNTABLE RIM

As in the past, the clutch is of the aluminum leather-faced, cork insert, cone variety of liberal contact surface. Though it is light in construction, the effect of the male member spinning when withdrawn and causing difficulty in engaging gears is eliminated by the addition of two brakes, one on either side. Power is transmitted to the semi-floating axles through the intermediary of a four-speed, selectively-operated change gear mechanism in which the high gear is direct drive. The springs, as heretofore, are of the semi-elliptical variety in front and three-quarter elliptic in rear; their efficient action is ensured by the addition of shock absorbers both front



DETAILS OF THE COMPRESSED AIR STARTING SYSTEM WITH WHICH PIERCE-ARROWS ARE EQUIPPED

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and rear. The brakes are internal expanding, operated by pedal, and external contracting, operated by side hand lever; both sets are equalized.

The wheelbase of the roadster, four- and five-passenger cars in all three models remains the same—namely, 119 inches, 128 inches and 133½ inches, respectively. On the seven-passenger and enclosed cars, however, it has been increased from 127, 134 and 140 inches to 132, 142 and 147 inches, respectively. Tire sizes remain the same, though the equipment has been considerably improved by the addition of demountable rims of a new type, which are manufactured by the Pierce-Arrow company itself. As may be seen by reference to the accompanying picture, the construction of the rims is quite different from anything else of the kind and has been developed as the result of a demand for a device of this kind in which complication has been reduced to the point where the application of the rims requires the minimum effort and experience; giving indication of the careful manner in which the development has been carried on, it is pointed out that experimentation has been carried on for no less than three years before the present construction finally was adopted. The rim is held in place by six bolts, two of the holes for the holding bolts being slotted; the purpose of the slots is to permit the operator to slip the rim in place where it holds itself instead of requiring that it be held until some of the bolts are replaced. Otherwise, the rim is constructed on the quick-detachable principle which permits of the removal or replacement of tires in the shortest time.

In the bodies little room for improvement has been found, the sides being of the proper height with regard to the dash and engine hood to give the very much desired straight-line effect, and as many as possible of the external protuberances having been relegated to less conspicuous places. Storage space is unusually liberal and, in the case of the forward compartment, has been carefully worked out by providing miniature part lockers built directly into the cowl dash. Limousine bodies, as heretofore, will be distinctive by reason of the arched effect over the doors, which construction is calculated to increase head room and also to add to the attractiveness of the body.

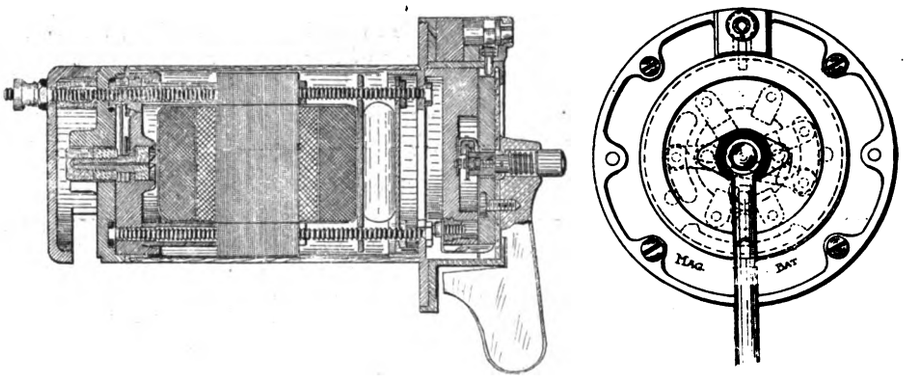
Compound That Preserves Steel's Polish.

Unless parts made of polished steel are rubbed frequently or kept covered with grease, rust will form. A method of treating the surface so that it will preserve its polished appearance for months without attention, however, is to smear on the surface a paste formed of one ounce of camphor dissolved in a pound of melted lard to which a quantity of black lead has been added. Allow the preparation to remain on the surface overnight and then wipe clean. The treatment will also keep nickel bright without constant polishing.

WAX ELIMINATED BY SPLITDORF

Brings Out Transformer of Purely Mechanical Assembly—Hot Spark Insures Almost Infallible Engine Starting.

Supplementing a line of magnetos, spark coils, spark plugs and switches, the completeness of which is one of its excellent features, the Splitdorf Electrical Co. of New York City has developed and practically has ready for the market a new type of transformer which is a radical departure from anything of the kind that has come from the Splitdorf works. It is styled a tube-switch-transformer, and as its name suggests is of the variety in which the low-tension current transformer is enclosed in a dash-mounted tube which serves also to carry the usual switch for making and breaking the ignition circuit.



SECTIONAL VIEW OF NEW SPLITDORF TUBE-SWITCH TRANSFORMER

Though the idea involved in the arrangement of the component parts is not brand new, but is rather an adaption of designs of a similar kind which over a number of years in hard service have demonstrated their ability to withstand the wear and abuse to which such things generally are subjected, the construction of the device is new and embodies a number of features calculated to increase its efficiency and to reduce wear and tear to the minimum. Thus, for instance, the principal feature of the apparatus, barring its newness to the Splitdorf line, of course, is that the parts are assembled mechanically, there being no rosin, wax or other compounds used to maintain the component parts in their relative positions. The immediate effect of this construction is to eliminate the possibility of heat from the engine causing derangements of the wiring. Incidentally, troubles caused by such compounds cracking, due to road or engine vibration, are entirely avoided.

Despite the fact that the new apparatus is small in size, the overall measurements being but 2¼ x 4¼ inches, contact bearing surfaces are unusually liberal and great pains have been taken to ensuer positive contacts under even the most adverse conditions. To this end, the rubbing contact surface is firmly imbedded in suitable insulating material and the contact blades are of simple bent form. Inasmuch as the rubbing surfaces are brightly burnished, wear in the parts is practically insignificant. By way of eliminating the possibility of verdigris forming and causing poor contact, particular care has been taken to make the switch parts perfectly waterproof. These parts, by the way, are heavily constructed to prevent damage resulting from short circuits and also to resist hard usage.

The arrangement of the whole apparatus is such that it forms a dual system in combination with an engine starting device which ensures positive starting, regardless of whether the circuit breaker of the magneto is open or closed. By reason of the winding, pressure on a button mounted in the dash plate causes an extremely hot spark to take place in the cylinder, which is ready to be fired. To start a cold engine merely requires that it be cranked once or twice, in order to fill the cylinders with explosive mixture, when, with the switch thrown to the battery position, pressure on the push-button serves to ignite the mixture and start the motor. Another of the refinements which has been incorporated in the design is the addition of a lock by means of which the switch may be locked in the "off" position to prevent the theft of the car. Differing from other and similar constructions, however, the key may be withdrawn from the lock while the switch is in operation, and need not be left in place during the time the engine is running.

Where Automobiles Have Lost Ground.

Yucatan, Mex., is one of the spots on the globe in which the automobile really has lost ground. According to the report of the American consul, in Merida, the capital of Yucatan, the streets of which are well paved, the number of automobiles licensed has declined from 200 to 109, six of which are electrics. He attributes the loss to the decline in the price of sisal, the chief product of the district. There are four garages in Merida, where a chauffeur's license costs 75 cents a month and a car license $5 per month.

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CRITICIZES OUR EXPORT METHODS

Well-Intentioned Purchaser Points out Conditions He Encountered—Red Tape and Price-Juggling Involved.

Because of the general reaching out for foreign trade and the more or less general establishment of export departments in the larger automobile factories, it naturally has been assumed that the handling of inquiries and orders from abroad has reached close to a fine art. But apparently not all of the lessons have been learned as they should be learned, and inattention to even simple requests for catalogs is more common than should be the case, while delays caused by red-tape methods and other circumlocution, to say nothing of juggling of prices by foreign agents for American cars, are such as give cause for wonder. Instances of the sort have been heard of before, but the best opportunity American automobile "export departments" have had to see themselves as others see them is contained in a communication addressed to an American consul in Russia by an exasperated would-be purchaser whose strictures have been made public for the good that they may do.

"For the past six months I have sought information of and written to various automobile companies which advertise in the well-known weekly and monthly American periodicals," writes this well-intentioned critic. "One of these companies replied that it had no cars for export and that my inquiries would be answered and a catalog sent by an exporting connection in New York. I have yet, after some months, to receive these. Two other firms, though I have written them twice, have never sent me their catalogs. I finally wrote their English agencies, and in this way secured the information I wanted.

"Another firm, very prominent in the Glidden tour last year, when quoting the price of a certain type car, told me I could have it shipped direct from New York, gave the cost of packing, etc., f. o. b. New York, and stated that my letter had been sent to its London agent, who would reply to my inquiries regarding certain mechanical features. Eventually the London representative wrote me they had referred my letter to their agent in Russia, who finally partly replied to my letter, but in French. I then discovered that I was supposed to pay, not the American advertised price plus cost of getting it here, as I inferred from the manufacturer's letter would be the case, but approximately $150 more for the two-cylinder runabout this firm sells for $625 than I could have bought the same car for from an agent in the United States, had it packed, paid ocean freight and duty and landing charges, and thus got it here myself.

"The other vehicles about which I sought information have been touring cars, ranging from $690 to $1,600, and in one instance a 15-hundredweight capacity delivery wagon, intending to try one of the latter and, if satisfactory, to purchase two more for the company's use. In but three cases did I receive the courtesy of a direct reply to my inquiries. One or two concerns informed me that my letter had been referred to their London or Paris agency; but generally I did not receive their American catalogs which I wanted, and the first acknowledgment of my letter would be from European agents with pamphlets containing the brief specifications given in the American advertisements, with the added statement that any further information required would be furnished by some 'Mr. Ivan Ivanovich' or other, in Odessa, Moscow, or Petersburg, and from whom, in some instances, I have received letters replying in French or Russian to my inquiries put in English and sent to America. From others I have yet to hear.

"Briefly, I find that, with the exception of one firm from which I have not yet had time to get its London prices, I cannot buy a car of any of these makes by writing to America; that in 70 per cent. of the cases I cannot get the courtesy of a direct reply to my letters written in English; and that I am supposed to pay, without any exception other than the one just referred to, $75 to $417 more than the same cars are sold for by agents in New York, allowing all costs of crating, freight, duty, etc.

"Most striking is the case of one firm which sells a touring car for $690 at its agencies in the United States and for $1,337 in St. Petersburg. It costs $25 to crate this car, approximately $75 for ocean freight either to St. Petersburg or Batum, and $110 for duty, with, say, $10 landing charges and $10 for insurance, bringing the total to approximately $920. I wrote this firm in America for full information, asking them to send me descriptive literature. I eventually got two catalogs and a letter which I consigned to the waste paper basket on seeing I was supposed, if I purchased this car, to pay $417 in excess of its cost in America. The cars priced $1,000 to $1,500 will, in the same manner, cost anywhere from $75 to $200 more than I could get them for by paying all expenses myself, if I were permitted to purchase direct in the United States.

"Far different has been my experience with British manufacturers or London agents of French, Belgian, German and Italian cars. In 12 different inquiries on cars costing $1,750 to $4,000 I have in all cases received the fullest information.

"As a contrast to the apparent arrangements made by American manufacturers for the sale of their product abroad it is interesting to note that the makers of one of the best English cars offered a friend in Batum the agency of their cars for the Caucasus. It was my privilege to read their letter, and the friend was offered a per cent. reduction on the advertised and catalog price of their cars as his commission on each car sold; but this per cent. reduction was not to apply to any car sold in the district to a customer who bought his car direct in England independently of the agent. In other words, if I wanted this car I could buy it either direct from England or from the Batum agent. In either case, whether I bought it here from the agent or whether I purchased it in England and paid the charges of getting the car out myself, the price of the car would be the same to me.

"Although knowing I wanted the car purely for private use and that I was in no way interested in the sale of automobiles, four European firms offered me the car I inquired about at a reduction of 12½ to 17 per cent. simply to have one of their cars represented and running in this section.

"American cars, particularly in Russia, should have a splendid field. The British cars are built for the superb English highways and are too low, too heavy, and have too little road clearance—seldom 8 inches—for the Russian roads. There are a few firms that make what they call a "colonial" model with 9½ to 13 inch road clearance, but these cost about $2,750 in England, and with the superb coach work on their bodies are more expensive and luxurious than the masses in Russia can afford, or would appreciate to the extent of being willing to pay the difference in cost between an English and an American body. The French and German cars have more road clearance than the usual British car, but are also too expensive to enjoy widespread use and popularity here in Russia.

"The American car, however, that sells for $1,000 to $1,250 for a four-seater is, in road clearance, in weight, in price, and in finish, just what is required here to enjoy wide popularity and meet the pocketbooks of thousands who cannot afford a British, French, German, or Italian car—if they can be sold in Russia for what American agents sell them plus cost of freight, crating, and duty."

Fire Truck's "Stalling" Excites Lafayette.

It will go hard with the man who "monkied" with the carburetter on the motor fire truck which recently was acquired by the Lafayette (Ind.) fire department, if the detectives investigating the cause of stalling of the apparatus while on the way to a fire should perchance happen to lay hands upon him. The motor "choked" soon after the company left the fire house, and was only started after an expert from Detroit had discovered that some one had "cut down" on the needle valve. That it was done purposely is the accepted theory of the mayor and of the Board of Works, in view of the fact that considerable feeling had been aroused when the "self-propeller" was installed and the fire horses, which were no longer needed, were abandoned and the services of several firemen dispensed with.

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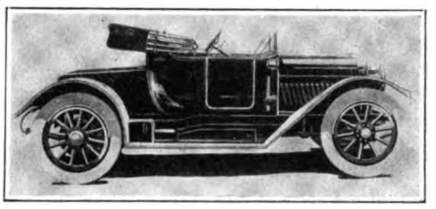
ABBOTT ADOPTS UNDERHUNG SPRING

Increased Power and Engine Starter and Lighting System in Separate Units Mark New Models—Other Refinements.

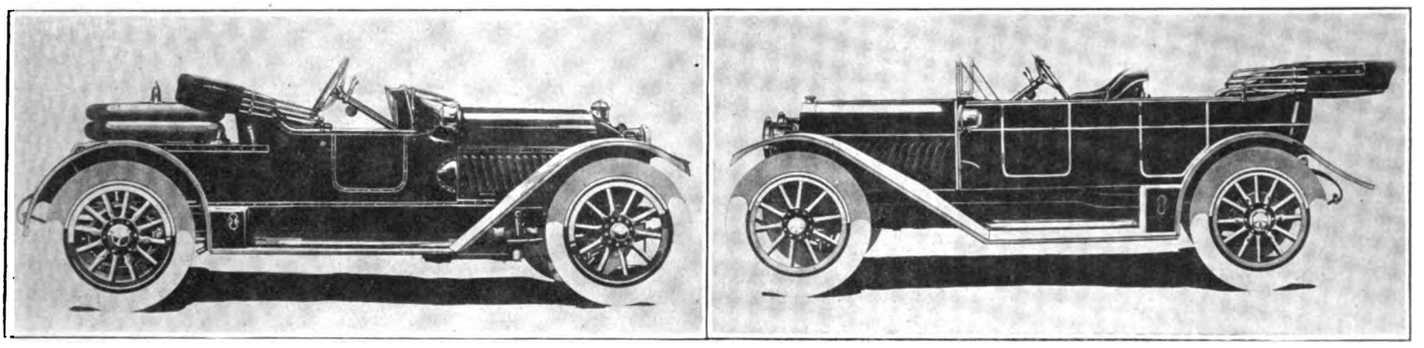
In common with several other manufacturers who have adopted the plainly understandable method of designating their products by model numbers which also serve to indicate the power of the engine, the two chassis which will go to make up the offering of the Abbott Motor Co., of Detroit, Mich, hereafter will be styled the 44-50 and the 34-40, both, as heretofore, being fitted with four-cylinder motors. As the old designations were 30 and 44, respectively, it may be gathered that both cars have been materially increased in power. As a matter of fact, though the salient features upon which the Abbott-Detroit reputation has been built have been retained both cars have been increased in nearly everything else as well as power. The increase is so marked in both of the cars that they are virtually new models throughout, particularly the 44-50, which by reason of much refinement and the addition of an electric lighting and engine starting system—this feature is common to both models—has appreciated materially in value if measured either by the mere dollars and cents of its price or by a critical analysis of its structural details.

Despite the fact that there are but two chassis cataloged by the manufacturer, the variety of body styles that are included in the line gives plenty of latitude for choice, and each individual car leaves little to be desired in the completeness of its equipment. Thus, for instance, there will be seven distinct body styles. Five of them, including the "battleship" roadster, which made its debut early this year and which since has given evidence of assuming to the leadership of the line; a small tonneau touring car, a five- and a seven-passenger touring car and a luxurious-appearing Berline limousine, are mounted on the 44-50 chassis. The other two, which are a three-passenger roadster and a five-passenger touring car, are mounted on the 34-40 chassis.

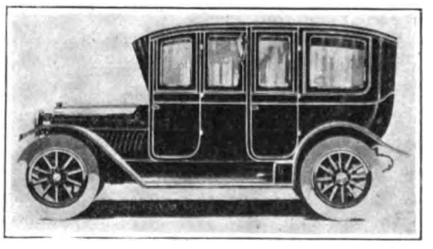
In the matter of equipment, the new electric lighting and engine starting system occupies the premier position, of course. It differs from other systems of the kind chiefly in that the motor starter and the lighting dynamo are separate units and are completely divorced from the ignition system, which is of the Splitdorf dual type and is a complete unit by itself. The electric starting motor is very compact and is bolted to the side of the crankcase. It drives the motor through a train of gears and a positive friction clutch, which effectually precludes the possibility of damage resulting to the starter in the case of a back-fire. Power is derived from a storage battery of liberal capacity, and this is maintained in a constantly charged condition by means of the dynamo, which is separately mounted and driven. As an additional precaution against back-fires, the starting operation is controlled by means of the spark advance lever, which must be in the fully retarded position before the engine can be started. The remainder of the system includes the usual automatic switch to prevent the discharge of the battery through the dynamo when the engine is idle and a complete complement of head, side, tail and speedometer lamps. The remainder of the equipment, excepting the top and side curtains, which are listed as an extra, includes Booth demountable rims, tire irons, tool kit, jack, pump and tire repair outfit.



"34-40" STANDARD ROADSTER



TWO ABBOTT-DETROIT MODELS ON THE "44-50" CHASSIS—"BATTLESHIP" ROADSTER AND TOURING CAR



"44-50" ENCLOSED LIMOUSINE

Other than the more or less minor detail improvements which have been made in the larger model and which must be reckoned with by reason of their undoubted influence on the efficiency of the car as a whole, the most noteworthy change which has been made in the chassis concerns the spring suspension. By way of increasing the resiliency of the springs, and thereby raising the easy riding quality of the car to an even higher standard, both sets of springs, front and rear, have been hung beneath the axles instead of over them, as heretofore. Another of the advantages which this system of suspension possesses is that the center of gravity of the car is appreciably lowered and its stability correspondingly increased. The front springs are of the semi-elliptic variety and the rear members are of the three-quarter elliptic type, both sets being long and of proportions calculated to render the use of shock absorbers unnecessary.

Except for the addition of the lighting and starting system, which has necessitated very slight rearrangement of some of the minor details of the motor—it is of the well-known Continental make—it remains practically the same, the cylinders being of the L-head type cast in pairs and measuring 4½ x 5½, bore and stroke, respectively. Cooling is effected by pump-circulated water, and the lubrication system is of the well-known Continental double pump type, in which one plunger pump forces oil to the timing gears in the front of the crankcase and the other forces the oil to the main engine bearings. Particular attention has been given to the size of the bearings, with a view to reducing wear to the minimum, and they are unusually liberal.

The clutch remains unchanged, and is of the dry multiple disk type, in which the 12 plates are alternately tool steel and steel faced with raybestos. This mechanism, together with the change speed gears, is enclosed in a tight housing which is firmly bolted to the crankcase of the engine with which it forms a unit, thus precluding the possibility of shafts getting out of line

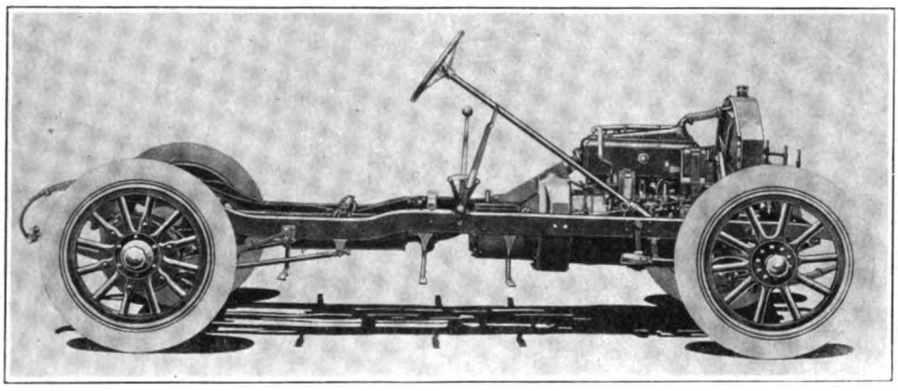
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and causing trouble. The change speed mechanism provides three speeds forward and reverse, and is selectively operated by means of a lever conveniently located within easy reach of the driver's right hand.

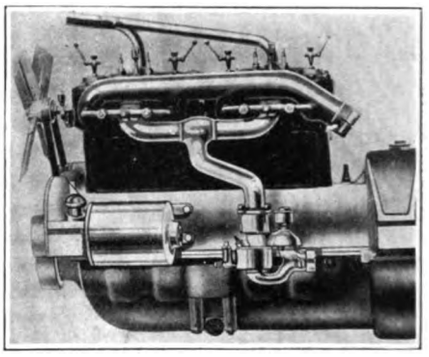
The rear axle and differential also remain practically unchanged, the drive axles being of the full-floating type and enclosed in a housing properly braced to withstand the rigors of bad-road touring. The size of the brakes has been increased from 14 to 16 inches, and by way of increasing their efficiency both sets are equalized. Proper means of adjustment is provided, and all wearing parts are equipped with liberal-sized grease cups. Both sets of brakes are located on the rear wheels and are of the internal expanding and external contracting types. The wheels are constructed with a view to the strains which they must withstand, and the spokes are unusually large in order to provide a liberal factor of safety. Tire sizes are the same both front and rear—namely, 36 x 4½ inches. The wheel base of the car has been increased from 120 to 121 inches.

Except that the wheel base is 116 inches—it was 110 inches in the previous model—and that there is a corresponding difference in size in the other component parts, the 34-40 model is practically a mechanical duplicate of the larger one. The motor, of course, is slightly smaller, though it is of the same make. Thus, the overhead valve mechanism which last year was a feature of the smaller model, has been displaced, the valves in the new engine being located all on the same side, where it is a simple matter to enclose them completely by means of a single tight cover. The bore and stroke of the engine are 4⅛ x 5½, respectively, the horsepower rating being obtained at approximately 1,000 revolutions per minute. Inasmuch as the motor is capable of giving off 42 horsepower, it may be appreciated that the rating is conservative.

The remainder of the chassis, as already has been mentioned, is much the same as the chassis of the larger model, the essential elements embracing the same multiple disk clutch, three-speed selective gear mechanism, full-floating rear axle and underhung springs. In line with the improvements which have been made and the increased equipment, the prices of both models have been increased slightly. The 44-50 in seven-passenger touring car form now lists at $2,000, which represents an increase of $200. The small tonneau and limousine have been increased in price from $1,775 and $3,000 to $1,975 and $3,050, respectively. On the smaller model the price of the touring car has been increased from $1,350 to $1,700, the roadster also listing at the latter figure.



RIGHT SIDE OF ABBOTT-DETROIT "34-40" CHASSIS



ABBOTT-DETROIT "44-50" MOTOR

Respect That Is Due the Grindstone.

The grindstone in a machine shop should be treated with more respect than it usually receives. It can be as easily ruined by lack of attention and forethought as any of the seemingly more delicate adjuncts of the shop, and unless care and consideration are exercised in the use of the device, good results cannot be expected.

A stone should never be allowed to stand with the bottom immersed in water for any length of time, for the practice will cause the lower part of the stone, which naturally is the heavier part, for they are very seldom, if ever, perfectly balanced, to become brittle and wear out more quickly than the rest. A flat spot, which will preclude the possibility of accurate grinding, will result. The stone should be wetted only when in use. The "drop by drop" method from a suspended bucket is best. In case a flat spot does develop, it can be corrected by turning down the stone, and for this purpose a piece of gas pipe is to be recommended. When the preliminary or rough cut has been taken off with the gas pipe, the application of a piece of "scratch" stone will soon put the surface in perfect working condition.

Although care should be exercised in selecting a grindstone, it is not always possible to choose one which will be absolutely free from soft spots and flaws, and this is especially true with stones of large diameter. Naturally, if the stone is harder on one side than on the other, the softer side will wear hollow, which will in time render the stone useless. The defect can be remedied, however, by the use of boiled linseed oil. The stone should be thoroughly dried and the soft side turned uppermost and brushed with oil, which will sink into the stone. The operation should be continued until the stone will absorb no more of the oil. A few days will suffice for the oil to dry, when the stone is ready for use. Flaws—that is, holes—should be filled with a mass consisting of stone-pitch (earth wax), 5 parts; tar, 1 part; powdered sandstone, 3 parts; by weight. The mass should be heated to the boiling point and stirred until thoroughly mixed. After heating the defective places in the stone by the application of red hot irons, pour the mixture until the hole is completely filled. After the filler hardens, the stone should be turned and dressed until the surface is in prime condition.

The speed at which a grindstone revolves is a point which often is neglected although such neglect oftentimes leads to serious consequences. Not only are tools liable to be "burned" on a stone which travels at too high rate, but the stone itself is liable to be torn asunder by the centrifugal force.

It is important to clean all tools and articles before grinding, carefully removing all grease, oil, etc., as the pores of the stone become clogged with these impurities, which not only considerably diminish the cutting qualities, but also impare the strength of the stone. Should one side of the stone be very much lighter than the other, the defect can be fixed by "weighting" that side with lead so that the motion of the stone will be uniform. Naturally, if the stone is firmly and truly mounted on an arbor which turns in bearings which allow very little play, "wobbling" will be prevented and better results obtained.

Goodyear to Issue Another Publication.

"No-Rim-Cut News" is the title of a monthly organ, the publication of which has been undertaken by the Goodyear Tire & Rubber Co., of Akron, O. In addition, the Goodyear company issues three other publications—"The Motorcycle Bulletin," the title of which explains itself; "The Family Newspaper," which is issued twice a month to the company's sales organization, and the "Winged-Foot Clan," a semi-monthly which is distributed among the factory employes, whose welfare and efficiency it is designed to promote.

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THE RELATION OF STEERING KNUCKLES TO SAFETY

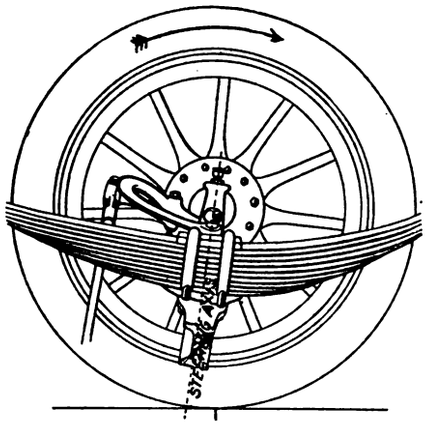
The "Vital Point" in the Light of Life Insurance and the Important Part It Plays—Influence That Has Been Exerted by Experience in Altering Designs—Variety in Methods of Construction Revealed by Modern Practice.

It is doubtful if there is any one part of an automobile, or, strictly speaking, any two parts, which play a more important part than do the steering knuckles. It is true that the safety of passengers—and of pedestrians, too—depends to a great extent on the efficiency of the brakes, but it is on the steering knuckles that the greatest responsibility falls, for whereas the failure of the brakes does not necessarily jeopardize life or property in every case, provided the vehicle can be maintained on its course at the will of the driver, failure of the steering apparatus is, generally speaking, of serious consequence. On more than one occasion, the steering knuckle has been styled "the vital point," and there is every reason to believe that the designation is apt.

Breakages and their consequences are very much less in evidence now than they were in the early days of the automobile, of course, and there are any number of very good reasons why this should be so. In the first place, experience has dictated the proper size of knuckles to use, and in the second place it scarcely need be pointed out that, through the efforts of a veritable army of metallurgists, materials have improved in quality several hundred per cent. within the past few years. Incidentally, designs of the knuckles themselves, and of the connections, have in the majority of cases been improved out of all semblance to their original shapes, and in a number of notable instances, protracted experiment coupled with designing skill has resulted in the production of patterns which reduce the liability of disastrous results following the fracture of parts to a point where it is very nearly negligible.

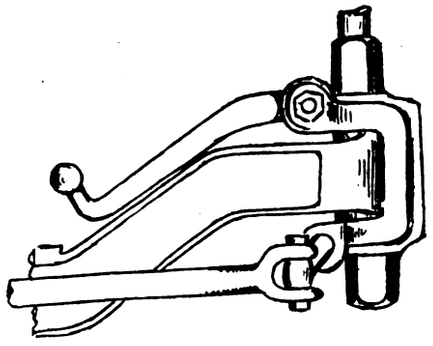
That is to say, whereas the fracture of a knuckle a few years ago virtually took the control of the car out of the driver's hands and put it into the hands of Providence, knuckles and steering connections now are made by more than one manufacturer which may be relied upon to hold the car to its course, irrespective of whether one or both of them is doing its duty in permitting the car to be guided. In other words, if one of the steering knuckles should be accidentally broken, or the tie-rod which connects them should fail, the car still would pursue its original course. Needless to add, if the knuckle which connects with the steering hand wheel were broken it would be impossible to guide the car, however.

The effect which is obtained by those manufacturers who attempt to obtain this result is styled a "caster effect" and finds its most frequent example in the caster upon which various pieces of furniture are mounted. Another familiar example is the ordinary bicycle fork. Without going deeply into the subject, which is not very deep at best, the result is obtained by locating the point of contact between the wheel and the road just back of the steering axis. The effect is that the steering wheels virtually "trail," and of course maintain the vehicle in the same path it was traversing prior to breakage of the steering knuckle.



CASTER EFFECT ILLUSTRATED

Notable among those manufacturers who obtain this caster effect with their products is the Timken-Detroit Axle Co., of Detroit, the theory as applied by this company being illustrated in the accompanying sketch. Strange as it may seem, the accomplishment of the result necessitates no radical alteration in design or construction of the axle or steering connections. Instead, it necessitates merely that the steering yoke be tilted backward slightly. The easiest way to do this is to employ spring pads that are slightly thicker at one end than they are at the other, and this is the method that is used by a large number of car manufacturers whose products are Timken-equipped.



B. & S. CASTER

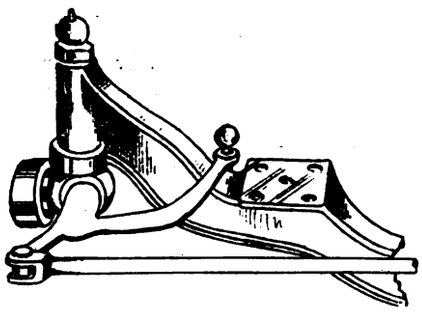
In the products of the B & L Caster Axle Co. of Chicago, the title of the company indicating that the caster effect has been made a cause of construction rather than an effect, the accomplishment of this feature has been sought after in a very much more elaborate manner, the construction of the steering knuckle, which is one of the very few that are of the reversed Elliot type, being illustrated herewith. In this construction, the axle penetrates three-eighths of an inch forward of the spindle center, thus throwing the point of contact between the road and the wheel that distance behind the steering axis. The effect is that the front wheels will continue in the same direction they are pushed by the rear wheels unless their direction is purposely changed by the driver. Incidentally, the construction of this particular axle is such that the turning point is in the center of the wheel, which throws the load more directly on the bearing center.

But, as has been explained, though a great many manufacturers take advantage of this caster effect, or make a point of obtaining it, there still remains a great number whose chief reliance is placed upon the excellence of their steering knuckles and connections and who make no attempt to obtain a caster effect, even when it requires merely that the existing type of spring pads be replaced by others of tapering form. Their faith in thus relying on the strength of materials is justified, of course, by the comparative scarceness of steering knuckle troubles.

This does not alter the fact, however, that there must of necessity be a tremendous strain on this portion of any car, nor does it remove any of the responsibility from the parts themselves. Added to the strain imposed on the parts when the wheels are turned—it varies from practically nothing when the car is traveling fairly rapidly to an amount that is unsuspected when the car is standing idle, and it becomes necessary to turn the wheels before the car can be moved, as in a garage, for instance—there is the strain of the sudden jar and jolt caused by one or the other of the wheels passing over an obstruction in the road or dropping into a hole. It is

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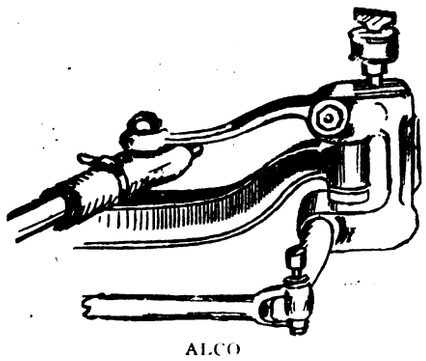
practically impossible to measure these stresses, and the only logical course to pursue is to allow a liberal factor of safety in designing. Needless to add, this is common practice. Still, exceptionally large steering knuckles may not necessarily indicate great strength. A few years ago, no inconsiderable number of prospective purchasers of cars were in the habit of judging of a car's worth by the size of its steering knuckles almost as much as by anything else. To-day, however, it is different, for it is realized that mere size is no



MITCHELL

indication of ability to withstand punishment.

Another factor which must be reckoned with in the design of steering knuckles—and, indeed, in the design of every other part which is under constant strain—is the vibration that is caused by the passage of the car over the roads. It is only in comparatively recent times that the effect of constant vibration in crystallizing steel has been noted. As an indication of the effective manner in which science, assisted by, or in the garb of, sport, has wrestled

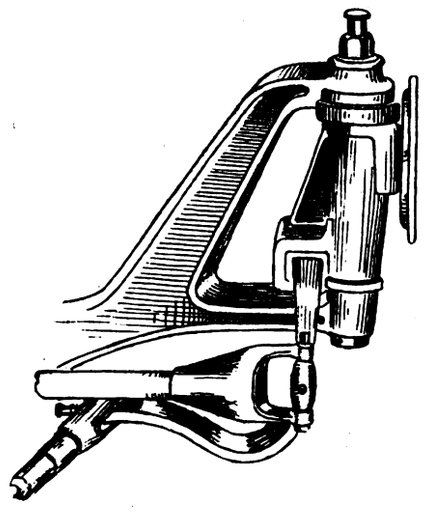


ALCO

with the problem, the experience of some of the cars in the two last long distance races on the Indianapolis Speedway might be cited. Last year three of the cars in the race were retired with broken steering knuckles. In two of these cases it was given out that the cause of the trouble had been crystallization. This year, though cars of the same make were driven by the same drivers, there was not a single instance of the kind. Though it may have been coincidence, which is unlikely in view of the fact that the average speed of nearly all the cars was greater, it is much more likely that manufacturers profited by their previous experience to redesign their steering knuckles, or at least to make them of even better materials.

As regards the various parts that go to make up a steering gear complete, practically the same confusion of nomenclature obtains, as it is noticeable in connection with other parts. Consequently it may not be irrelevant to point out that the tie-rod is the rod which connects the steering arms on both knuckles; the reach rod is the one which connects the steering hand wheel with the tie-rod through the intermediary of one of the steering arms. The words steering arm, of course, will be understood to mean the projection from the knuckle to which the tie-rod is attached and which serves to turn the wheels.

In the majority of cases a position behind the front axle is favored for the location of the tie rod. In a few cases, the tie-rod is placed in front of the axle, though in general it is believed that the rod is less liable to accidental damage when placed in

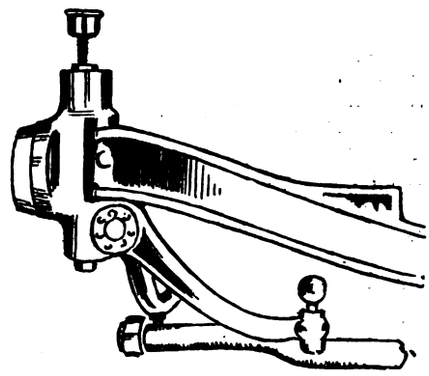


RENAULT

the less conspicuous position. The worst that could happen to the rod would be its fracture, due to accidental collision with a projection in the road, and though trouble of this kind scarcely would require very energetic hunting, it would be less likely if the rod were placed behind the axle.

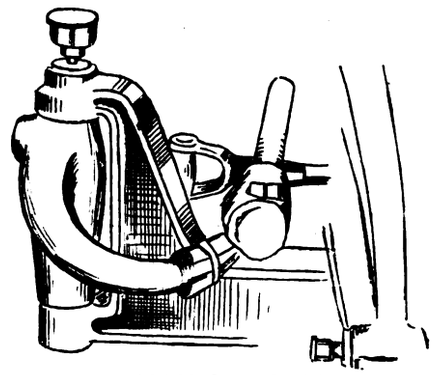
Less serious trouble, of course, involves the accidental bending of the tie-rod, and this trouble is a great deal more prevalent than generally may be supposed. It may or may not seriously impair the ease with which the vehicle may be steered, but in any case it indicates its presence by the condition of the tires in a shorter or a longer period of time, corresponding to how little or how much the rod is bent. When the rod is bent, it naturally causes the wheels to "toe" in or out, according to whether its position is in front of the axle or behind it, and instead of rolling smoothly over the road they scrape along partly sidewise, the immediate effect being the elimination of the tread on the tires.

For much the same reason—namely, to prevent it from accidental injury due to obstructions in the roadway—the reach rod also is placed high in the majority of cases and the principal steering knuckle is arranged over the front axle. The proper protection of the reach rod is perhaps of even greater importance than the protection of the tie rod, for, as has been explained, in case of fracture of the latter it sometimes is possible to steer the vehicle by reason of a caster action. But where



PIERCE-ARROW

the reach rod or the principal steering arm is broken, the control of the car is lost. Incidentally, by placing the rod as high as possible and the steering arm over the front axle the danger of these parts coming into contact with road obstructions with just sufficient force to change the direction of the car without breaking the parts also is removed. In this respect, it should be remembered that even a momentary change of direction when a car is moving at high speed may be sufficient to



COLUMBIA-KNIGHT

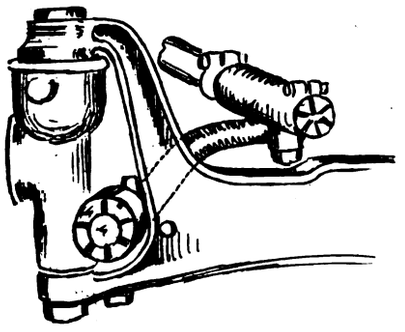
run it into a ditch or into another car, the speed of the car itself determining the number of feet it will traverse in a given time for a known deflection of the road wheels.

The general practice with regard to the construction of these two rods is to provide some means of lengthening or shortening them a certain amount in order to compensate, temporarily or permanently, for slight disalignment of the wheels caused by either bent steering arms or a bent tie rod. Where such means of adjustment is provided it is a simple matter, of course, to line the wheels up temporarily on the

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road if the tie rod becomes bent. It is the precaution of the wise motorist to test the alignment of the wheels occasionally, especially when touring in rough country. And it is equally wise to remove a bent tie rod and straighten it at the first opportunity if the advantage of being able to make adjustments at some future time is to be felt.

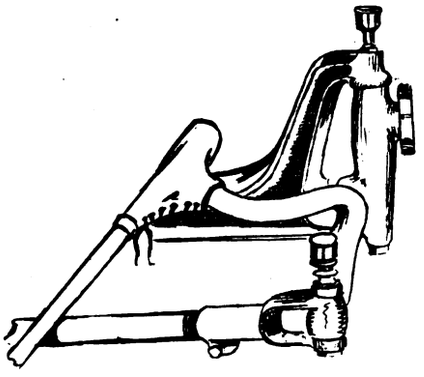
There are three general types of steering knuckles in use, the Elliott type, which is by far the most popular and is employed by



KNOX

at least 90 per cent. of all manufacturers; the reversed Elliott type, and the Lemoine type, the latter two having but few exponents.

Among the better known cars in which the Lemoine type of steering knuckle is employed is the Mitchell, the design, as developed by the Mitchell-Lewis Motor Co. being illustrated herewith. The view shows the axle and steering knuckle from the back, and as may be seen, the tie rod is located behind the axle with the steering

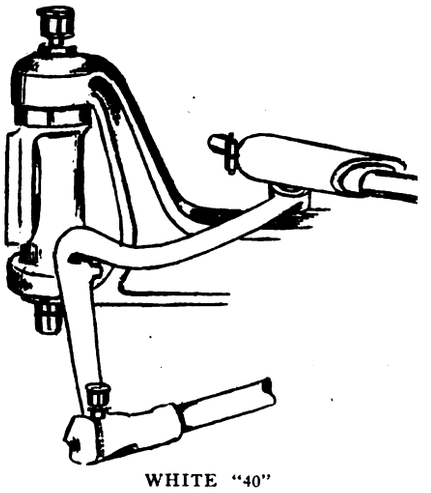


BUICK

arm above it, where it is thoroughly protected from accidental injury. The design is distinctive and differs from all the others in that the axle end is a solid forging drilled vertically. The spindle is formed integral with the steering arm and is inserted through the vertical hole from the bottom.

Alco cars are among the very few in which the reversed Elliott form of steering knuckles are used, the design being distinctive for this reason and also for its particularly rugged construction. The reversed Elliott type differs from the Elliott type in that the axle is inserted in the yoke which is formed by the knuckle. This portion of the axle in the case of the Elliott type forms the yoke which receives the spindle between its ends. In the Alco cars, also, the steering arm is located above the axle, though the construction differs from the others in that the arm proper is not forged integral with the knuckle proper, but is a separate forging which afterward is bolted in place, the method of construction having the advantage that it avoids the simultaneous forging of the comparatively heavy knuckle and the lighter projecting arms. The Pierce-Arrow car is another in which the reversed Elliott type of knuckles is used, and though the principle is the same, the construction is quite different, as may be seen by comparing the pictures. In the Pierce-Arrow car, for instance, the steering arm is located below the axle instead of over it, though it is protected by the location of the tie rod. Here, too, the steering arm is a separate forging which afterward is bolted firmly in place.

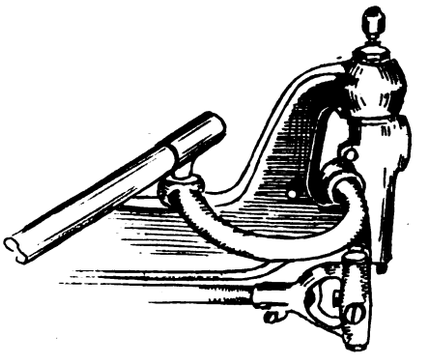
As a matter of fact, this method of construction is fairly common, though it is



WHITE "40"

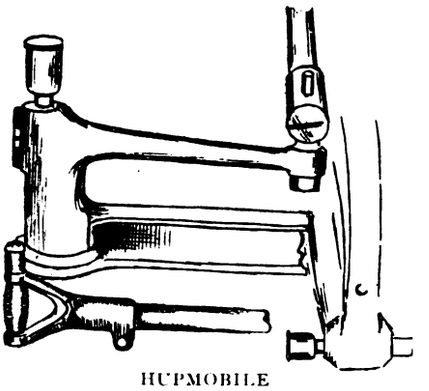
not quite as common as the method in which the knuckle and all its parts are made integral. In Stutz cars there is another example of this method, the steering arm, as shown by the picture, being separate and coming above the axle. The tie rod is located behind the axle, the knuckle itself being of the Elliott type. Knox practice reveals construction that is quite similar, the knuckle being of the Elliott type with the steering arm located above the axle with the tie rod in a protected position behind it. Foreign practice differs but little from American with regard to the design of steering connections, Renault construction, which is typical of French and other European design, revealing the Elliott knuckle with the steering arm and tie rod located behind the axle. The steering arm in this case is perfectly straight and is a separate forging bolted to the knuckle, the principal point of variance being in the location of the reach rod which is placed below the tie rod.

In the lighter and lower priced cars the method of forming the knuckle and the steering arms integral with the steering knuckle generally is the order, for it simplifies construction and assembling and reduces somewhat the number of parts involved. This arrangement of the parts does not necessitate any particular location of either steering arms or reach or tie rods, of course. In the Buick and White "40" arrangements, for instance, the tie rod is placed behind the axle with the steering arm above the axle, the construction being



STUTZ

quite similar in both cases. In the Hupmobile arrangement, however, the steering arm is over the axle, with which it is parallel when the wheels are not deflected, and the tie rod is in front of the axle and below it. Still another variation is found in the Columbia-Knight cars, though the knuckle is of the Elliott type with the steering arms integral. Here, though the steering arm is located above the axle, it also is in front of it, the location being best made plain with the aid of the picture. The



HUPMOBILE

tie rod in this case is placed behind the axle and as high up as the proximity of the frame will permit.

In making the connection between the steering arm and the reach rod, it is the invariable practice to form the end of the steering arm into a ball which fits into a socket in the reach rod. By way of reducing the amount of road shock transmitted to the driver through the steering wheel, and also to relieve the parts of some of the strain imposed by road vibration and the jars and jolts which are caused by the wheels passing over obstructions, the ball at the end of the steering arm is cushioned

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between two helical springs, the whole usually being enclosed in a leather boot which serves the purpose of retaining the lubricant and at the same time excluding dust and dirt.

The construction quite naturally permits a certain flexibility in control which is not obtainable otherwise, and thereby reduces the strain on the driver by no uncertain amount. Incidentally, it results in a certain amount of lost motion between the steering wheel and the road wheels, and though it is so small as to be negligible, it nevertheless opens up an interesting question which, on more than one occasion, has been the cause of discussion.

It is held by some manufacturers that for the best all around results—that is to say, the easiest steering and the least wear on tires—the front wheels should be lined up absolutely parallel. It is held by others, however, that the best results are not produced unless the wheels are turned in slightly, the amount varying from one-quarter to three-eighths of an inch. And though it would seem that there is little excuse for turning the wheels in, that it undoubtedly would cause excessive tire wear, there really is reason in the method. For instance, experience tends to prove that with ordinary construction the wheels of a car will spread outward immediately the tie rod is removed or broken. To those who have had opportunity to witness an accident of this kind, or who have been unfortunate enough to be concerned in one, the phenomenon should be perfectly plain. Suffice to say, the result is substantially as stated—that is, the wheels almost invariably turn outward, though just why this should be it is difficult to explain.

It is pointed out by some that it is one of the effects of road vibration which causes the wheels to turn outward, and it is on this theory that the wheels are set so that they are closer in the front than they are in the back by about one-quarter of an inch. The primary reason for setting them this way, of course, is the lost motion which must almost of necessity be present in the steering connections. Thus, if they are slightly closer together at the front and the road shocks tend to cause them to fly outward, their movement to the limit of the lost motion will bring them parallel. Other manufacturers who set their wheels parallel in the first place scoff at the explanation and contend that there is, or ought to be, just as much tendency for the wheels to turn inward under the influence of road shocks, and for this reason the expedient of setting them to turn inward a fraction of an inch is ignored.

However, this is one of the problems to which the future may bring a solution, and though it is a minor one at best and one which need cause very little loss of sleep for the reason that either method of setting the wheels is equally effective, the fact remains that it hedges on an unanswered question—it is one of the few unanswered questions, however, and it is a matter of opinion whether the game of searching for the answer is worth the candle.

Rajah Evolves Engine-Starting Plug.

To complete its line of Rajah spark plugs, which now comprises plugs of all sizes for both pleasure and commercial car use, the Rajah Auto Supply Co., of Bloomfield, N. J., just has placed on the market the engine starting plug shown in the picture. Those parts of the plug which have to do with the sparking, the steel shell, imported porcelain, knife edge bushing and central wire electrode, are of usual Rajah construction. Held fast to shoulder on the steel shell by means of a jam nut, however, is a hollow yoke which serves to carry the mixture to be introduced into the cylinder to a passage drilled through the steel shell. Above and below the yoke are



copper-asbestos gaskets, which prevent the escape of the gas. The gas is conducted through the center of the plug, and passes all around the spark gap so that firing, practically, is certain. The application of the starting attachment, however, in no way impairs the facility with which the plug can be taken apart and cleaned, and the operation can be completed without disarranging the gas piping.

Detector Shoots Numbers After Accident.

Necessity is said to be the mother of invention, and if such be true that dear old lady has a varied and wonderful array of offspring, ranging from devices to prevent earthquakes to simple little instruments which may be carried in the pocket and whose uses are legion; but Oscar Weissenborn, formerly president of the Berkeley Club, in Hudson City, N. J., has added one to Old Lady Necessity's children which, aside from any necessity for the device, is fully as wonderful as any. It is a detector for the car of the man who runs down a pedestrian and then seeks to escape. Bows and arrows are generally associated with the little summer-clad God of Love, but there is little inkling of love in the Weissenborn device, although the bow principle appears. There is a bow arrangement at the front, the bow being held back by a string so that when the car strikes anyone the string is broken and the bow shoots—not arrows, but a handful of the car's number plates, thus scattering over the roadway a whole hatful of clues to the identity of the machine. Legislation is all that is needed to bring the device into use and bring riches to the inventor—and legislation usually is difficult.

Use Cheap Fuel to Test Their Cars.

Because there are several grades of "petrol" or "motor spirit" on sale in London, and because they vary considerably in quality the manufacturers of Siddeley-Deasy cars have hit upon the novel scheme of employing the lowest grade in testing their cars before final delivery. The grade that is used is the same as is supplied to taxicab and motor bus companies, whose cars are equipped to operate on benzol, if necessary and is styled "Pratt's taxi-bus motor spirit." The reason for the innovation, is it explained, is to demonstrate that the cars can be run efficiently on this and other low grade fuels, and thus to set at rest any fears regarding their operation on cheap fuel, which might be engendered in the minds of prospective purchasers of cars.

Truck Floors that Require Caulking.

The floors of motor trucks which are used for such service as carting ice, ice cream, or commodities which are in liquid form and liable to "slop over" should be caulked so as to prevent in so far as possible, the mixtures from reaching the gear set, clutch, propeller shaft, etc. Before the seams are caulked, however, a priming coat of paint should be applied to the seams and allowed to dry, otherwise the water which is retained in the oakum or cotton which is used to fill the cracks will cause rapid deterioration. The planks should be perfectly dry before the seams are caulked, so that when they become moist and swell perfectly tight seams in the truck floor will result.

Unwise Use of Air Compressors.

Although there may be no particular danger of blowing up compressed air reservoirs such as are used for tire inflation or engine starting purposes, due to the fact that almost invariably they are equipped with some sort of a safety valve to prevent such contingencies, it is unwise for obvious reasons to permit an air compressor to run for a greater length of time than is necessary to obtain the desired pressure. In the first place, it causes the pump to heat up excessively, and in the second place it causes an amount of wear that decreases the life of the pump proportionately.

Care With the Blow-Torch on Aluminum.

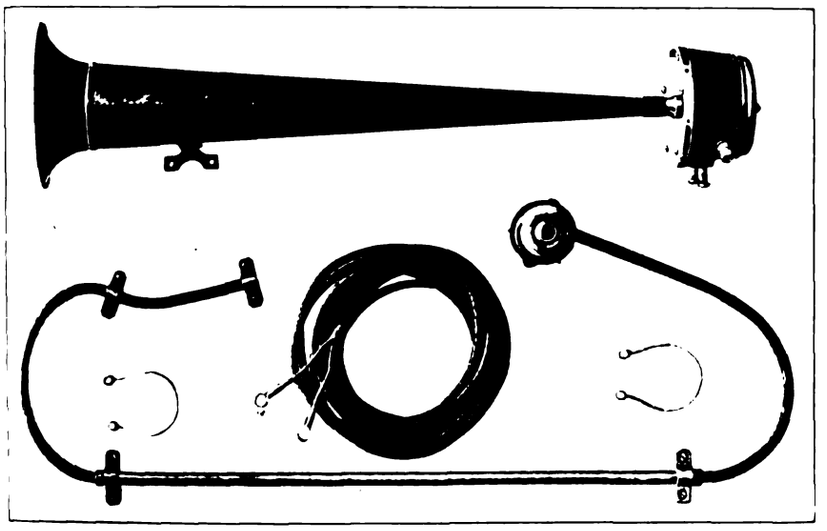
The melting point of aluminum is quite low, and for this reason it is necessary to exercise care when using a gasolene blow-torch or other source of extreme heat on aluminum parts, especially if they are rather thin, to avoid melting through the soft metal.

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RECONDITE MEANING IN "MAXEFF"

Name of Horn Is Clever Combination of Abbreviations—New Electric Product and How It Operates.

Ever since the organization of the Maxeff Electric Horn Co., of 814 Woodward avenue, Detroit, Mich., several months ago, it has been generally supposed that the cryptic Maxeff represented a combination of some of the letters of the organizers' several names. It transpires, however, that such is not the case. In choosing the distinctive name, the manufacturer has intended to indicate by its letters that the horn has been designed to realize maximum efficiency both as to wearing qualities and and to tone volume and clarity. As originally developed, the Maxeff horn resembled in shape the orthodox type of bulb horn and was intended primarily for outside location. Since then, however, another type has been developed in response to a demand for a light, compact, and above all, efficient type of electric signal horn which may be located under an engine's hood as standard equipment.



MAXEFF UNDER-HOOD TYPE OF ELECTRIC SIGNAL

It is on the different construction of the horn and its scientifically determined design that the manufacturers base their claims of superiority over other electric horns of the same general type. By reason of the arrangement of the component parts, arcing and pounding at the contact points has been eliminated thus effectually doing away with one of the more or less common sources of trouble to which horns of this type fall heir. Incidentally, as the pounding is done away with, the method being one of the horn's patented features, wear in the parts is proportionately decreased. Laying emphasis on the efficiency of the horn, which produces a deep-toned note not unlike that of a bulb horn, the current consumption at six volts is but .07 of an ampere. The reason for the low current consumption is explained by the mechanical arrangement of the parts, which is such that in the down stroke of the armature and hammering pin no retractile springs are used to work against the magnetic pull. This is another of the features upon which patents have been allowed. Another of the features which increases the strength of the note produced and accounts in no small measure for the small amount of current necessary to operate the horn is that the diaphragm is not punctured as commonly is the case with horns of this type. The tonal quality of the sound produced is accentuated by reason of the shape of the sound chamber which is carefully proportioned in size and shape to the size of the diaphragm. Giving



MAXEFF BULB-TYPE SIGNAL

evidence of the thoroughness with which the whole problem has been attacked, in the search for maximum efficiency, care in designing has been carried even to the wiring, which is arranged to be carried in a metal tube. In explanation of this feature, it is pointed out that in matters of details of equipment much of the difficulty experienced with electric signals can be traced directly to the wiring, and it is hoped by thus enclosing it so that there can be no possibility of its becoming accidentally deranged or worn so as to cause short circuits effectually to remove the cause of trouble.

Why Electric Systems Need "Exercise."

That storage batteries which are but partially discharged and then fully charged again, the cycle being often repeated, will in time lose their capacity is an established fact. With most of the electric lighting and electric engine starters now on the market, however, the condition of full discharge is very seldom approximated, since the dynamo is continually charging the battery during the daytime, and is carrying the light load at night when the car is in operation, so that the batteries are nearly always fully charged. Only when the motor is inoperative and the lights are burning, or for that fraction of a second when the engine starter is in operation, are the batteries called upon to furnish any appreciable amount of current. Obviously the batteries are not operating under the best of conditions to insure long life.

H. J. Murch, of Worcester, Mass., who owns a Cadillac car fitted with a Delco electric starter which also serves to furnish the current for lights, has devised a plan which not only provides the battery with the proper amount of "exercise" to keep it in first class trim, but which also puts to use the extra current generated by the dynamo. On the dash of his car Murch has placed a pair of sockets arranged to accept two "jack" plugs attached to flexible electric light wires which, in turn, are connected to the house lighting mains. On "plugging in" each evening, when he lays up the car, the owner can call upon the batteries to furnish sufficient current to light five 16-candle-power lamps, used for house illumination.

To Prevent Escape of Acetylene Gas.

Not only are leaky acetylene gas pipes a source of danger, but they are a constant source of waste, for each ounce which escapes naturally reduces the supply of gas just so much. Too much care, therefore, cannot be taken in examining the rubber hose connections, which should be replaced at least a couple of times during a season. The copper tubing, too, should be tested at least once every season, especial care being directed toward the elimination of cracks at the joints and bends. As is the case with the gasolene supply pipe, a loop will obviate much trouble. That few motorists pay any great amount of attention to the condition of the lighting system recently was demonstrated at one of the Prest-O-Lite service stations, when in the piping of 40 cars tested 22 were leaking.

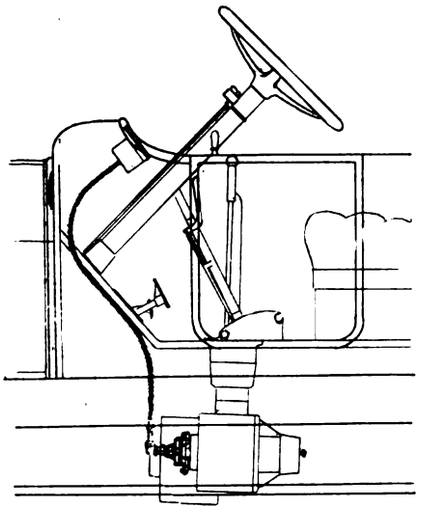
The ball check valves which control the movement of oil through the pump where pressure feed lubrication is adhered to, should be cleaned occasionally to insure proper working.

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Speedometer Drive That Is Unusual.

Taking its cue from the generally noisy and otherwise inefficient speedometer-drive methods that prevail in a great many cases, the Knox Automobile Co., of Springfield, Mass., has developed a new method of driving that necessary adjunct. It is calculated to eliminate at once not only the noise which usually emanates from the generally loose-fitting and rapidly-rotating gears, but to get further back into the trouble and eliminate the first cause of the noise, which, briefly, may be summed up in the one word "wear."

In the ordinary unprotected position on one of the front wheels, it is an undisputed fact that the gears accumulate more or less mud and road dirt, the immediate effect of which is to cause wear. It follows that if the mud is of the clay-like and clinging variety its effect is to force the



gears out of mesh when the accuracy of the speed indicating instrument becomes to all intents and purposes nil. In the new Knox method, the driving gear is arranged on an extension of the lay shaft of the change gear mechanism, as shown in the accompanying sketch, and as it is thoroughly protected by the underpan, accumulations of foreign matter in an amount sufficient to impair its proper working are impossible.

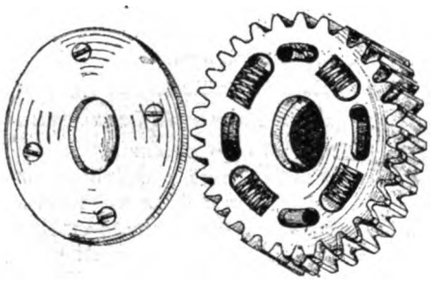
Incidentally, the flexible driving shaft is considerably shorter, and even though this portion seldom, if ever, gives trouble, the likelihood of the contingency is proportionately decreased. Another of the important advantages of the method of drive is that no amount of wheel bouncing, as when the car is being driven rapidly over very rough roads, can affect the speedometer reading by causing oscillations of the dial hand. The instrument itself is located in an extension of the cowl dash after the manner that has been originated at the Knox factory, and is in plain sight of the driver at all times.

Removing the End of Broken Tap.

The removal of the end of a tap which has broken off short in the work is a patience trying job. Where the proper size of tap for the hole has been used, and the operation has not been pushed too rapidly, the stub can be removed with a pair of tweezers. The hole should be thoroughly cleaned with kerosene squirted from a gun to remove all chips of the metal, and the tweezers, which should be as large as the work in hand will permit, should be applied to the hollows of the tap and the latter carefully worked to and fro until quite loose.

To Prevent Noise in Timing Gears.

Probably no part of the motor has occasioned more thought and experiment with regard to the elimination of noise, than the

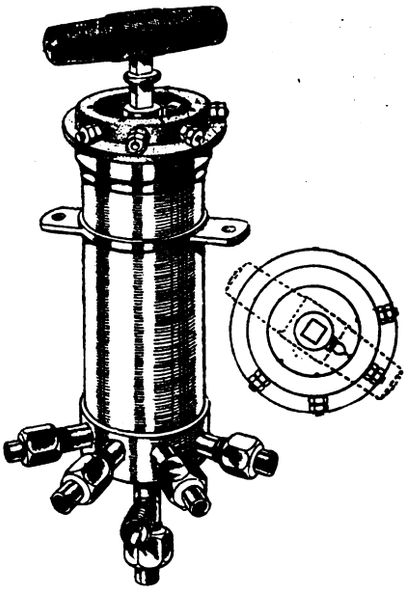


timing gear, and though much ingenuity has been brought to bear and many modifications have been made in existing devices, all of which have been directed toward the production of a silent valve gear, the efforts of designers have not ceased, despite improvements that have been effected. Much of the progress has consisted of enclosing the valve tappets and appendages in a chamber which serves not to eliminate the noise but merely to muffle it. But as it is only after a motor has been run for a sufficient length of time to allow wear to throw the various parts out of proper relation for the maintenance of silence, it is plain that not all of the improvement is real or lasting improvement.

With the idea of eliminating the noise caused by the clashing of the teeth of the timing gears, even after considerable wear has been occasioned by use, the arrangement shown in the accompanying illustration has been evolved abroad by the Hispano-Suiza Co., which is incorporated, and it is claimed that success to an unlooked for degree attends this Hispano-Suiza product. The device consists of two pinions of the same diameter but with different face widths, which are mounted concentrically on the crankshaft. Into pockets which are formed in the body of the pinion of smaller face which is not keyed to the shaft are placed four helical springs, which bear against four lugs, which protrude into the pockets from the body of the keyed pinion The springs serve to keep the movable pinion in such a position that the teeth always are slightly in advance of the teeth of the stationary pinion—with regard to the crankshaft—and thus the slight movement of the pinions with relation to one another compensates for any wear.

British Idea of Acetylene Starter.

Although America generally is conceded to be the home of the ignition type of motor starter, it is doubtful if even in America can be found a device of the kind bristling with such unusual features as characterize the Ashford starter, recently introduced by Ashford & Greenshields, of Lancaster, England. The most startling of the features are an electric "tell-tale," which is designed to indicate the cylinder that is on the firing stroke, and a rotary distributing valve, which is operated through the pump handle. The electric indicator, as the illustration shows, takes the form of a ring made of fibre which surrounds the pump barrel and which is provided with a terminal screw for each cylinder of the motor. A wire leads from the spark plug of each cylinder to one of



the terminals, so that a spark will jump across the gap formed between the terminal and a pointer on the pump rod when the pump handle is turned around so that the pointer is opposite the terminal corresponding to the cylinder which is on the point of firing. At the same time, the distributing valve, which is positioned in the base of the pump, opens communication with the same cylinder and closes off the other leads so that the charge is introduced only into the cylinder which is on the firing stroke. Carburetted cold air is used as a fuel, the attainment of a rich mixture even in cold weather being insured by a priming device on the pump, so that small quantities of liquid gasolene can be introduced if need be.

Slots that Give "Bite" to Screwdrivers.

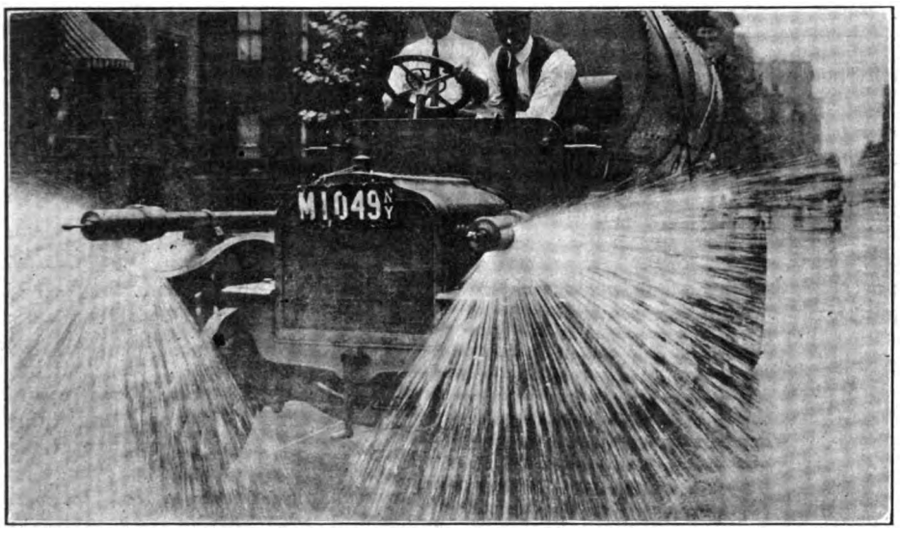
A screwdriver ground to the usual shape is not always effective on round-headed screws, for it is liable to slide out of the crack before the screw can be started. If, however, a small slot is filed on either side of the end of the driver, the device will get a better "bite" on the screw head.

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SPRINKLER SPRINKLES OWN PATH

Municipal Vehicle Designed for Indianapolis Has Sprayers at Front—Distributes Water Under Pump Pressure.

The problem of laying the dust which arises from dirt or macadam roadways is one which those interested in municipal welfare still have "under the microscope," and though dry treatment with calcium chloride, and treatment with gas tars and crude petroleum products are found to give excellent results, both are in the end more costly than the daily sprinkling with plain water. Thus it happens that innovations in "sprinkling carts" always are interesting to municipal engineers, especially if the innovative side is directed toward cutting down expense, or — which really amounts to the same thing in the long run—increasing the area which can be sprinkled in a given time. The sprinkler shown by the photograph was designed for that purpose by the International Motors Co.; it was built for the street cleaning department of Indianapolis, but last week was tried out in New York prior to shipment to the Hoosier city.



SAURER "DUSTLESS" FORCE-FEED STREET SPRINKLER

The sprinkling apparatus is mounted on a 6½-ton Saurer chassis of standard construction. The riveted tank, which is 4½ feet in diameter and has a capacity of 1,400 gallons, is mounted on a cradle and "guyed" with cross stays provided with turn buckles, so that shifting is impossible. The most novel features of the device, however, are the double acting force pump, which, driven by the motor, forces the water through the nozzles, and the location of the nozzles themselves, about a foot in advance and on either side of the motor hood. This location was adopted so that the truck itself would not cause the very evil it is designed to cure; the forward position of the spraying apparatus wets down the street in advance of the wheels, so a cloud of dust is not raised as a preliminary to the dust-laying.

The nozzles are made adjustable between wide limits, so that the quantity of water thrown out and the distance to which it is thrown can be regulated by the driver to suit the conditions. Obviously, with a pump maintaining a constant pressure, the water can be sprinkled over a much wider stretch of roadway than would be possible were the water permitted to flow out by gravity, and the areas sprinkled can be maintained constant until the last drop is out of the tank, whereas with the gravity feed, the area naturally diminishes with the loss of head in the tank. It is claimed that a roadway from 70 to 80 feet wide can be sprinkled at one operation, and at a rate of well over 10 miles an hour, which naturally is quite beyond the scope of the horse-drawn sprinkler.

University to Confer "A. E." Degree.

Although automobile schools or "chauffeur factories" where instruction in the driving and operation of motor cars is dispensed are so common as to be almost regrettable and though several colleges have undertaken more technical instruction, the University of Southern California is preparing to go further than any of them. A department devoted exclusively to automobile instruction, which will cover not only the operation of the vehicle but all the little as well as the important points in motor car design and construction, has been instituted in the university, Stanley Smith, C. E., and Earle Y. Boothe, M. E., occupying the chairs. They are now busily engaged in mapping out a curriculum to be covered in the two years devoted to the course. Graduates, both male and female, for the U. S. C. is a "co-ed" college, will receive a degree stamped "A. E.," which will signify that at least four years have been spent in preliminary technical study.

DISCUSSES TIRE-MAKING METHODS

Goodyear's Factory Manager Interestingly Deals With the Subject—Processes Employed and Results Obtained.

"The question, 'Which is the best type of automobile tire?' long has been a subject for discussion, and probably never will be settled to the satisfaction of everyone," says P. W. Litchfield, factory manager of the Goodyear Tire & Rubber Co., Akron, Ohio, in dealing with the matter, "but the fact that a tire has a molded or a wrapped tread does not make it good or bad, as a properly compounded or properly vulcanized tire by either process will be better than one improperly vulcanized by the other method.

"There are three prominent types of automobile tires — the one-cure wrapped tread, the one-cure molded, and the double-cure wrapped tread.

"The one-cure wrapped tread process is building the complete tire upon a core, pressing two metal side-flanges against each side of the tire up to the point known as the tread, then cross-wrapping the whole thing with strips of cloth, putting it into a heater and vulcanizing.

"In the one-cure molded type, the complete tire is built upon a core, put into a full mold, and then put into a press or heater and vulcanized.

"In the double-cure tire, the carcass is made upon the core, which is then put into a full mold and partly vulcanized. After this has been accomplished, the tread is applied to the carcass and the vulcanization completed.

"The double-cure tires are made in two ways: First, after the carcass has been semi-cured, the tread is applied to the carcass before the carcass is removed from the core. It is then wrapped and the vulcanization finished. The Goodyear Tire & Rubber Co. process, however, is exclusive, in that the semi-cured carcass is removed from the core, the tread applied, then inflated upon a rim with an air bag inside, wrapped and vulcanized. This Goodyear process insures the completion of the vulcanization of the tire in exactly the same shape which it will have when in use, equalizing all the strains in the fabric, and reducing the possibility of fabric breaks and blowouts.

"The disadvantages of the one-cure wrapped tread process are that the fabric is not thoroughly impregnated with rubber, that there is not sufficient pressure for proper vulcanization, and the tire tends to separate and disintegrate prematurely. This can be overcome to some extent by using the highest possible quality of material.

"In common practice, however, this process is usually employed by makers of unguaranteed tires, or low quality tires, in

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which the defects of this process are emphasized.

"The second or full molded type of tire is the cheapest method, from the standpoint of first cost, where the workmen are sufficiently skilled to avoid fabric buckles and pinches. Its disadvantages are that the thin side walls and thick treads are subjected to the same heat for the same length of time and that the fabric and friction on the side walls are cured more than the fabric and friction on the tread, the most under-cured portion of the whole tire being where the tread united with the carcass in the center. This tends to cause tread separation and fabric disintegration long before the tread has worn out, the consumer thinking he has a good tire one day and having it go to pieces the next. In other words, it is not a well balanced tire. Also, this process has the disadvantage that in case there is any fabric pinching or buckling, it is not apparent to the inspector, and large quantities of tires are liable to be manufactured before the defect is discovered. In many cases, the first knowledge of the defect comes to light when the tire is returned for replacement.

"The third, or double-cure wrapped tread, process is the highest in cost manufacture, requires more labor, more time, more equipment, and more material in the tire. It has the advantage, however, of curing the carcass the same in all portions, the thickness of the wall being the same all the way round; it thoroughly impregnates the fabric with rubber, preventing separation; it shows any defect in the construction immediately, so that the faults can be quickly corrected, and no seconds slip through as firsts; the carcass and tread can both be made properly and the tire perfectly balanced."

Ingredients of a Fireproof Paint.

As a matter of precaution, no other than fireproof paint should be used in or around a garage. A good paint of the kind which is lasting and durable when applied to wood and which will materially lengthen the time necessary for the wood to catch fire, is made of the following ingredients taken by weight: Powdered asbestos, 40 parts; aluminate of soda, 10 parts; lime, 10 parts; silicate of soda, 30 parts, and enough non-resinous coloring matter to obtain the desired shade. The ingredients should be thoroughly mixed with sufficient water to make the application easy. Two coats should be applied.

Rubber Matting Destroyed by Oil.

Because rubber is used in the form of floor covering instead of tires, it does not follow that it is immune from the effects of oil. Many rubber mats are destroyed by oil which drips on them and is not removed. A piece of waste or rag dipped in gasolene will remove the oil thoroughly, if the bulk of it first is removed with dry waste. While gasolene is a solvent for rubber, it evaporates quickly.

AUTOMOBILE AS ALUMINUM'S AID

Franklin Company's Metallurgist Discusses Relations of This Metal to Motor Car Industry—Origin and Uses.

"The development of the aluminum industry is contemporary with the development and growth of the automobile industry," says J. H. Nead, metallurgist of the H. H. Franklin Mfg. Co., of Syracuse, N. Y. "One might say that it is perhaps due to the impetus caused by the demand created by the automobile industry for a light, strong metal that the rapid advance in the commercial production of aluminum has been made.

"Aluminum is one of the most abundant elements in the earth's crust. It is a component part of all clays and of much of the rocky structure of the earth. It is known to all as a light metal of a silver white color, which has a marked resistance to oxidation and nearly all corroding actions. The melting point is 1,215 degrees Fahr. This melting temperature makes it a fairly easy metal to melt for foundry purposes. Aluminum has a specific gravity of practically two and six-tenths or about one-third that of steel. This makes it the lightest of all commercial metals and to this property is due a majority of its numerous applications.

"The strength of ordinary aluminum in bar form is about thirty thousand pounds per square inch. Bar aluminum castings will generally show a strength of about 12,000-14,000 pounds per square inch, but for casting purposes bar aluminum is seldom used but rather one of the very valuable aluminum alloys.

"Aluminum unites quite readily with most of the common metals except lead. One of its most useful and important alloys is formed with copper and is widely used for casting purposes for automobile work. When cast it has a strength of about twenty-two thousand pounds per square inch. It is very resistent to repeated strains and will maintain its strength very well at slightly increased temperature.

"Because of these two properties, it is admirably suited for such services as engine bases and crank cases.

"The automobile manufacturers create a demand for aluminum in the customary commercial shapes, such as rods, sheets, wire, etc. Sheet aluminum is an admirable material for automobile bodies. In addition to its lightness it will not rust, is very easily worked and takes a very excellent finish.

"The builders of the Franklin have been in the foreground of manufacturers who have recognized the advantages of aluminum. The Franklin car is one of the lightest built and aluminum is used freely in its construction.

"The Franklin body is made of sheet aluminum, the base of the engine is aluminum, as is the carburetter body and the transmission gear case. These are the big parts of the car that are aluminum and there are a large number of smaller parts made of this light metal and its alloys."

Jigs and the Purposes They Serve.

Not everybody who has to do with automobiles fully understands the meaning of the word "jig" and the exact uses of that device, notwithstanding the very frequent use of the term when the subject of automobile construction is discussed.

Briefly stated, a jig is a fixture, usually made of cast-iron or steel, or both, which is attached to a machine to hold a part in the proper position for drilling, usually where more than one hole is to be drilled. For instance, if a jig were not used it would be necessary on every piece drilled to "lay out" the piece with scale, scratch awl and compass to determine where the holes were to be made. A jig made to exact dimensions is intended primarily to insure accuracy, perfect interchangeability, and of course save time and money in production.

In the Franklin cylinder base flanges, for instance, four holes are drilled, and their positions must be accurate within five-one-thousandths of an inch in order to "line up" with the other parts. To lay out and drill one of these flanges by hand would require at least an hour and a half of the time of an expert workman where with a jig the job can be done in fifteen minutes at the outside by any workman who can run a drill, and absolute accuracy is assured.

In mechanics other forms of jigs are recognized, but the drilling jig as probably the most common and the form most employed in automobile construction. When the large number of small parts used in an automobile are considered, it will be readily seen that the jig system is a most important item in producing a mechanically perfect car at a minimum cost to the purchaser.

Repairman Makes Frank Admissions.

"Have you ever found a satisfactory repair shop?" asks James Keenan, who is in the repair business in San Francisco, and who then answers his own query in this wise:

"No? Well, the chances are that you won't. Do you know that one of the expensive items for automobile manufacturing is that for 'testing' the completed car—finding what bolts have a tendency to work loose, what bearings run hot, what things squeak, work hard and fail to behave as they should, etc.—and every time your car is torn apart for repairs, it should have the same 'testing' as if it was just being built for the first time? Don't expect your car to come out of the shop in perfect shape, for it won't. Things are going to shake loose and run warm, just as they did when the car was new. The moral of this tale is, get a car that needs least repairs, that needs least dismantling to get at the principal parts."

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NEWARK OBJECTS TO CONFETTI

And Arrest of Confetti-Thrower Disturbs Four States Tour—Otherwise Indiana "Boosters" Boost in Peace.

Not an incident worthy of the name disturbed the trail of Indiana automobile "boosting" talk which, in combination with much confetti, very much advertising matter and a considerable supply of music, both instrumental and vocal, marked that part of the Four States tour which lies between Akron and Canton, which was the night control reached Sunday last, 14th inst. Incidentless, also, was the trail from Canton to Wheeling, W. Va., which was reached on the evening of the 15th, and from Wheeling again across the state line into Ohio as far as Zanesville, the night control reached Tuesday evening, 16th.

The minds of the tourists were, for the time at least, taken from the exploitation of their respective vehicles when Newark was reached on the way from Zanesville to Columbus, for the first of the cars arrived just in time to see the official path marker, W. D. Edenburn, "pinched" by the local force, which impressed the Nyberg truck for use as a police patrol. At the station houes Edenburn was charged with littering the streets with confetti, which he distributed from the Great Western car so the course might easily be followed. The magistrate discharged the guide with a reprimand, and the tourists were warned not to distribute advertising literature within the city limits. Columbus was reached on the afternoon of the 17th, after an uneventful trip from Newark. The better part of the evening was spent at the banquet board, the host being the Columbus Automobile Club.

The run from Columbus to Chillicothe was hard and occupied most of the afternoon of the 18th. From Chillicothe the tourists proceeded to Portsmouth, but owing to the road building operations numerous detours were made necessary. At Portsmouth the tourists entered an automobile parade, which formed one number on the program of a local carnival. From Portsmouth the cars proceeded to Ironton, Ohio, from whence they were ferried across the Ohio river to Huntington, W. Va., the night control. Huntington was "wide open" to the "boosters," as, indeed, were most of the towns along the line of travel. Sunday, 21st, was the second and a very much needed "day of rest," and but few of the pilots stirred from the hotel.

Early Monday morning, however, even the sleepiest of the travelers was astir when the cars were loaded onto the steamer Castilia. The lines were cast off at 3 A. M. and the party enjoyed a 50-mile sail on the swollen Ohio to Maysville, Ky. Arrived, the Great Western pathfinder proceeded to mark the 63-mile course to Lexington, which was reached by the tourists on the afternoon of the 22d. From Lexington the course led over a tortuous, though a good, road to Louisville, where the party spent the evening of the 23d.

The Four-Staters are due to finish to-day in Indianapolis, from which city they "set sail" on July 9th.



AT LIMA, O.—ONE OF THE PEREMPTORY ORDERS THAT BID THE FOUR-STATE TOURISTS TARRY

At a meeting which resulted in the formation of the Edwardsville (Ill.) Motor Club, the following officers were elected: President, C. F. Rock; vice-president, L. D. Lawnin; secretary, Dr. E. H. Schwartz; treasurer, J. F. Ammann.

NO AWARDS IN WISCONSIN MEET

Too Many Perfect Scores Render Award of Trophies Impossible—Easy Rules and Good Roads Responsible.

Clean scores were the rule with the contenders in the third annual reliability tour of the Wisconsin State Automobile Association, which finished in Milwaukee, Friday last, 20th inst. For of the 14 participants in the event, 12 who were contesting for the Sentinel trophy and two for the Schandein cup—the latter for private owners—all but two finished without a demerit. As the contest finished with tied scores, both cups will remain in the possession of the association for the remainder of the year. The non-award of the trophies must be laid at the doors both of the contest committee of the promoting organization, which so modified the rules under which the cups were contested for, that penalizations were meted out only to those contenders who did actual work on the motors while on the road, and of the good roads enthusiasts along the line, who had put the roads traversed during the five days in such fine shape that the tour became a veritable "joy ride."

Monday, July 15th, was spent in the trip from Milwaukee to Beloit, the night control, 122 miles being covered. Roads were fine all the way, and but few of the contenders were delayed even by tire trouble. At Beloit the tourists were the guests of the Warner Instrument Co. at a banquet. Quite a few long stretches of sandy road were encountered on the second day's run to Baraboo—133 miles—but no machine was stopped on the road for repairs other

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than to tires. Thirty-nine points were chalked against H. M. Heinemann, who drove the King entry, when on the third day's run from Baraboo to Oshkosh the water manifold developed an obstinate leak, which necessitated immediate repair. The other contenders, however, came through the 134-mile trip unscathed. W. S. Soules, who piloted the Flanders car, withdrew before the next day's journey—109 miles, from Oshkosh to Green Bay—was completed. A frozen piston induced by inadequate cooling and due primarily to a leaking radiator caused Soules to abandon hope of finishing. The other contenders reached Green Bay Thursday evening without mishap. The last 129-mile leg of the journey was finished on Friday. The score:

For Sentinel Trophy.

Emile Hokanson, Buick	Perfect
Jacob Hanson, Case,	Perfect
James Holmes, Krit,	Perfect
Jay E. Morehouse, Hupmobile	Perfect
W. H. Diener, Ford,	Perfect
Thomas R. Bell, Flanders,	Perfect
Charles Spooner, Oakland,	Perfect
R. D. Rockstead, Paige,	Perfect
H. R. Gallun, Marion,	Perfect
R. G. Bates, White,	Perfect
H. M. Heinemann, King,	39
W. H. Soules, Flanders,	Withdrew

For Schandein Trophy.

H. O. Stenzel, White,	Perfect
J. D. Babcock, Franklin,	Perfect

Frank M. Joyce Crosses "Great Divide."

After an illness of more than month, Col. Frank M. Joyce, first vice-president of the American Automobile Association, died at his home in Minneapolis on Monday last, 22d inst. He was 51 years of age. Colonel Joyce long had been one of the most prominent and influential figures in automobile affairs in the Northwest and played a conspicuous part in whatever he entered into. He had served as president of the Minneapolis Automobile Club and of the Michigan State Automobile Association, and but for certain untoward events would have been elected president of the A. A. A. at its annual meeting in New York in January last. He was in line for the presidency next year, and had he lived there is small doubt that he would have been chosen to fill the post.

Paris Reduces Its License Fees.

Resident motorists of that Paris which is in France have occasion to rejoice, for at the last meeting of the Municipal Council it was decided to make material reductions in license fees. The license on two-seated vehicles will be reduced from 50 francs ($10) to 31 francs ($6.20), and on vehicles having more than two seats from 90 francs ($18) to 55 francs ($11). These fees are in addition to the horsepower tax, which also has been proportionately reduced on vehicles of less than 37 horsepower.

DUST SHORTENS A MOROSS MEET

So Much of it at Wilkes-Barre that Safety Required Alteration of Program—Kyle Wins Four Events.

Dust, more dust, and then some more dust, necessitated the shortening of the program which was offered on Saturday last, 20th inst., at the Driving Park track, Wilkes-Barre, Pa., by E. A. Moross and his following. Not only were one or two events eliminated, but after the track conditions were ascertained by the running of the first heat for the Remy Brassard and trophy, the A. A. A. representative, T. B. Schoemacher, refused to allow more than two cars on the track at a time. Hence, even the heats for the Remy Brassard assumed a match race aspect and, owing to the fact that the track was but half a mile circuit, which permitted the cars to start on the second lap before the clouds of dust stirred upon on the previous lap had had time to settle, all three were cut to two miles.

The advertised 25-mile race for cars with displacements under 600 inches became a two-mile match race between Burman (Cutting) and Kyle (White), and was won by the latter in 2:55. The first heat for the Remy Brassard went to E. A. McDonald, who finished the two miles in the Benz in 2:45, leading home Burman (Cutting). Hickman (Mercedes) and Kyle (White) dropped out after the first lap on account of the dust. The last two heats which were contested between Burman and McDonald went to the former in 2:42⅕ and 2:47, respectively. Burman drove an exhibition mile in 1:12 at the wheel of the Blitzen Benz. Driving the Cutting, he came off second best in a match race with Kyle (White), who finished the five miles in 7:43⅗. A second match race, which, however, went for only two miles, also resulted in a victory for the White pilot, who finished in 2:42⅕. In the time trials, Kyle (White) and McDonald (Benz. completed a single mile in 1:19⅕, while Burman (Benz) set the time at 1:15⅗. The summary:

Five miles, match race—Won by Kyle (White); second, Burman (Cutting). Time, 7:43⅗.

Two miles, for the Remy Brassard and trophy. First heat—Won by McDonald (Benz); second, Burman (Cutting). Time, 2:45. Second heat—Won by Burman (Cutting); second, McDonald (Benz). Time, 2:42⅕. Third heat—Won by Burman (Cutting); second, McDonald (Benz). Time, 2:47.

One mile, time trial—Burman (Benz). Time, 1:12.

Two miles, match race—Won by Kyle (White); second, Burman (Cutting). Time, 2:42⅕.

Two miles, match race—Won by Kyle (White); second, Burman (Cutting). Time, 2:55.

Sued, Claims he Played Good Samaritan.

Charles J. Petbury, of Brooklyn, N. Y., has ceased to take stock in the Good Samaritan story, and, if his tale be true, not without good reason. Petbury has been made defendant in a suit brought by Mrs. Mary Holland, as administratrix of the estate of her husband, Michael Holland, who, she claims, was knocked down and killed by an automobile driven by Petbury on May 2nd last. Petbury's answer is almost more than a plea of not guilty. He declares that, instead of knocking down Holland, he succored him. He alleges that the deceased had been knocked down and run over by a runaway horse, and that while he was lying injured on the road he (Petbury) happened along in his automobile and ran over the prostrate man. Petbury asserts that instead of being responsible for the death of Holland he is more deserving of thanks, as he picked him up and rushed him to a hospital, thereby acting the part of a Good Samaritan. Mrs. Holland, nevertheless, asks for $10,000.

Electric Car Chosen A. A .A. Pathfinder.

For the first time in the history of what is termed pathfinding, an electric vehicle—a Flanders—will undertake to lay out the route of the A. A. A. national reliability tour from Detroit to New Orleans, that privilege having been awarded to the Flanders Mfg. Co., of Pontiac, Mich. The car, which will be directed by W. O. Westgard, an A. A. A. road expert, is to start from Detroit on Monday next, 29th inst., and, though the 1,100 miles route is strenuous and paved roads are few and far between, it is expected that the undertaking will be completed within two weeks. As charging stations are even fewer and further between than macadam roads, special arrangements are being made for recharging along the line. It is officially stated, however, that the details of the route will not be made known until the return of the pathfinder.

Seeking to Make St. Johnsville Disgorge.

Andrew Carnegie has not yet bestowed a library on the good people of St. Johnsville, N. Y., but whether it was for the purpose of erecting a structure just to make the philanthropist feel cheap, or whether some equally worthy motive prompted the town authorities to "pocket" the fines collected from automobile speeders, as charged by the New York Automobile Association, doubtless will be explained in court. Members of clubs affiliated with the State Association complained of fines imposed by the St. Johnsville authorities and an investigation revealed that the fines collected were not forwarded to the state treasury as required by the motor vehicle law. Proceedings to recover $5,000 are to be instituted by the association.

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1,012,247. Spare Tire Cover. Hyman Cohen, New York, N. Y. Filed Dec. 7, 1908. Serial No. 466,215.

1. A tire cover, comprising a casing provided with overlapping flaps at its opening, and a flat resilient core in the outermost flap for forcing the same against the inner tire face, said core comprising a plurality of sections foldable upon each other.

1,012,288. Explosive Engine. William Stephenson, Newport, Ky., assignor to The Fox Reversible Gasoline Engine Company, Newport, Ky., a Corporation of Kentucky. Filed Sept. 30, 1909. Serial No. 520,367.

1. In an explosive engine, a compression and combustion chamber, a piston and crank shaft, an inlet for the mixed charge into the compression chamber so located as to be uncovered by the piston at the end of the suction stroke, an independent conduit between said chambers, an air inlet in said conduit for admitting air into the compression chamber on the suction stroke of the piston, and an exhaust port leading from said combustion chamber.

1,012,325. Tire Protector. John O. Caldwell, Jr., Boston, Mass., assignor of one-half to John O. Caldwell, Sr., Boston, Mass. Filed Mar. 19, 1910. Serial No. 550,446.

1. A tire protector comprising two relatively stiff members curved on radii corresponding respectively to the inner and outer curved surfaces of a tire shoe, and a flexible web connecting one edge of each member, the free edge of each member being provided with a flexible flap.

1,012,353. Tire Protector. Joseph C. Hammer, Chicago, Ill. Filed Nov. 7, 1910. Serial No. 591,053.

A tire protector comprising companion arms, said arms swinging around a common pivotal center, a shield-like member on the outer end of each of said arms oppositely disposed to one another and clamping the tire on opposite sides thereof, said arms being free with respect to the wheel body, whereby the shield-like members may be adjusted to the desired position upon the tire body, tension mechanism for holding the shield-like members in engagement with the tire body comprising a tension member located at one side of said pivotal center and exerting force tending to throw the shield-like members into engaging position with the tire, a boot positioned on said tire, and means for locking said boot to said shield-like members, substantially as described.

1,012,356. Asbestos Brake Band. Louis R. Hoff, Paterson, N. J., assignor, by mesne assignments, to The Asbestos Brake Company, a Corporation of New Jersey. Filed Nov. 5, 1909. Serial No. 526,432.

1. A brake provided with a liner comprising a layer of asbestos fabric impregnated with a drying oil and having a wire reinforcement.

1,012,367. Detachable Wheel Rim. Karl Kindscherf, Hanover, Germany, assignor to Continental-Caoutchouc & Gutta-Percha-Compagnie, Hanover, Germany. Filed Nov. 10, 1910. Serial No. 591,625.

1. In a detachable wheel rim, an engaging claw pivoted to the detachable rim, a flange rigid with said rim and a friction device carried by said claw and bearing against said flange to hold said claw in the position to which it may be adjusted on its pivot.

1,012,374. Spring Wheel. Emil M. Larson, Canby, Minn. Filed May 16, 1911. Serial No. 627,601.

1. A wheel, comprising a hub, a rim, a plurality of spokes connecting the hub and rim, a sectional tread surrounding said rim and spaced therefrom, said tread being composed of a plurality of tread members the ends of which are hingedly secured together by pintle bolts, a plurality of auxiliary spokes slidably mounted in said hub, the outer ends of said auxiliary spokes terminating in yokes which straddle said rim, the free end of said yokes being secured to the tread by means of the pintle bolts of the hinges thereof, a plurality of U-shaped clips secured to the rim and engaging said yokes to maintain the same in proper position with respect to the spokes while at the same time permitting radial motion of the auxiliary spokes, and cushioning means between said auxiliary spokes and the hub.

1,012,375. Tire. Frederick H. Lathrop, Chicago, Ill. Filed May 17, 1911. Serial No. 627,719.

A vehicle tire comprising a rim provided with annular flanges and provided with apertures, blocks provided with a groove and with apertures, and provided with an overhanging lip on one side thereof, said blocks arranged to fit on the rim and to extend through the apertures in the rim, a rubber band arranged to fit the rim, a cover consisting of metal pieces provided with bends adjacent to their ends, and extending transversely across the rubber bands, and wires over the ends of the metal pieces, and means to secure the ends of the wires in the blocks, said blocks arranged so that the overhanging lips thereon cover the ends of the metal pieces which abut against said blocks.

1,012,380. Mixer for Internal Combustion Engines. Robert D. Loose, Chicago, Ill. Filed Feb. 7, 1910. Serial No. 542,503.

1. A mixer for internal combustion engines, comprising, in combination, a casing, means at the top and the bottom of said casing whereby said casing is adapted for connection to the intake pipe of such engine, a regulating valve in said casing, a series of conduits in said casing occupying the entire interior space in said casing and affording a series of straight and unobstructed passages in said casing through said conduits and through the interstices between said conduits, said conduits having in their walls minute spaces adapted to retain moisture by capillary attraction, said conduits presenting to the ascending explosive mixture the narrow edges only, and means above and below said conduits to retain them in said casing.

1,012,408. Change Speed Mechanism. Robert Milne, Rockford, Ill. Filed June 29, 1911. Serial No. 636,039.

1. In a change speed mechanism, the combination of a drive shaft, a driven shaft, a supplemental shaft, a series of gears on the supplemental shaft positively locked thereto, a series of gears on the driven shaft opposed to the gears on the supplemental shaft, at least one series of gears being stepped, means for connecting the drive and driven shafts together, a gear connection between the drive and supplemental shafts, including a shiftable gear, means for disconnecting the drive and driven shafts when the gear connection between the drive and supplemental shafts is made, a shiftable gear for each set of opposed gears of the series of gears.

1,012,459. Vehicle Tire. Albert L. Siegrist, Akron, Ohio. Fied Oct. 10, 1910. Serial No. 586,161.

A vehicle tire comprising a rim formed of a plurality of sections, each section consisting of a member having inwardly extending side flanges adapted to embrace the felly and outwardly extending hook portions projecting in a direction opposite to said flanges, means for securing each section to the felly and a block of resilient material permanently secured between said hook portions.

1,012,562. Steering Gear for Automobiles. Charles B. King, Detroit, Mich., assignor of one-half to Ora J. Mulford, Detroit, Mich. Filed July 21, 1910. Serial No. 572,956.

1. In an automobile, the combination of an axle, an approximately vertical bearing thereon, an arbor in said bearing, a stub-axle extending laterally from said arbor above said bearing, a laterally extending lug on said bearing, and a lug extending from said arbor above said bearing over and under the lug on said bearing.

1,012,658. Hood Fastener for Automobiles. Carl C. Kusterer, Grand, Rapids, Mich., assignor to Keeler Brass Co., Grand Rapids, Mich., a Corporation of Michigan. Filed Apr. 15, 1911. Serial No. 621,350.

1. A fastener, comprising a spring case, a shank adjustable in the case, means for pivotally attaching the shank, a spring in the case, a rod engaged by the spring and projecting outside the case, and means for detachably securing the projecting end of the rod.

1,012,670. Windshield for Motor Vehicles. Allen Loomis, Detroit, Mich., assignor, by mesne assignments, to Packard Motor Car Company, Detroit, Mich., a Corporation of Michigan. Filed Oct. 15, 1907. Serial No. 397,573.

1. A windshield arranged for connection to vehicles comprising a lower panel hinged to suitable supporting means and adapted to swing forwardly, an upper panel hinged to the top of the lower panel and adapted to swing backwardly with reference to the lower panel, guide rods at the ends of the panels, and means for adjustably securing said panels to the rods.

1,012,730. High Tension Magneto Electric Machine. Frederick Richard Simms, London, England, assignor to The Simms Magneto Company, a Corporation of New York. Filed Feb. 23, 1910. Serial No. 545,453.

1. In a high tension magneto electric machine, the combination with the armature provided with separated lateral cheeks, and end plates connected therewith, said cheeks being extended at one end beyond the armature coil, to form a housing, of a condenser fitted tightly between said cheeks within said housing and a ring surrounding said cheek extensions and condenser, said condenser being held by said ring and cheek extensions from movement and vibration with respect to the armature during the rotation of the same.

1,012,796. Vehicle Wheel. John N. Bartle, Wichita Falls, Tex. Filed Oct. 28, 1910. Serial No. 589,639.

1. In a wheel, a rim, a hub, and spokes

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carried by the hub, the rim being formed with spaced flanges, and the curved spring spokes seating at their outer ends between the flanges and frictionally engaging the rim between the flanges and forming a pawl and ratchet connecting means therebetween.

1,012,828. Storage Battery. Thomas A. Edison, Llewellyn Park, West Orange, N. J., assignor to Edison Storage Battery Company, West Orange, N. J., a Corporation of New Jersey. Filed May 24, 1910. Serial No. 563,842.

1. In a storage battery, the combination of a row of tubular electrodes of one polarity, a row of flat electrodes of opposite polarity parallel to said tubular electrodes, and non-conducting separators each arranged to contact on one of said flat electrodes and two adjacent tubular electrodes to prevent contact between said flat electrodes and tubular electrodes, said separators being arranged to have substantially point contact only with said tubular electrodes, substantially as described.

1,012,847. Motor Driven Steering Axle for Motor Vehicles. Charles B. Hatfield and Charles B. Hatfield, Jr., Cornwall-on-the-Hudson, N. Y. Filed Mar. 20, 1910. Serial No. 552,129.

1. In a motor vehicle, the combination with an axle having a pivotal connection with the frame for steering, of a ball member secured to the axle, a driven gear surrounding the axle, a spherical ring mounted and snugly fitting on the ball member and having a convex surface upon which the gear is mounted, and pivotal connections between the ring and the ball member and between the ring and the gear at substantially right angles to each other.



INDEX TO ADVERTISERS



A

Abbott Motor Co..... 70
Adamson Mfg. Co..... 68
Ajax-Grieb Rubber Co..... 63
American Ball Bearing Co..... 72
American Motors Co..... 71
American Starter & Carburetor Mfg. Co. 67
Apple Electric Co..... 66
Argo Electric Vehicle Co..... 56
Atwater Kent Mfg. Works..... 56
Automobile Supply Mfg. Co..... 17

B

B & L Caster Axle Co..... 64
Badger Brass Mfg. Co..... 70
Baldwin Chain & Mfg. Co..... 60
Bantam Anti-Friction Co..... 67
Barthel, Daly & Miller..... 64
Bartholomew Co. 59
Benz Auto Import Co..... 65
Bosch Magneto Co..... 63
Bossert Co. 55
Bretz Co., J. S.....Inside front cover
Briggs-Detroiter Co. 66
Brown-Lipe-Chapin Gear Co..... 67
Bush Mfg. Co..... 56

C

Cartercar Co. 66
Champion Ignition Co..... 65
Champion Spark Plug Co..... 72
Clarke-Carter Automobile Co..... 68
Classified Advertising 52-53
Colonial Electric Car Co..... 70
Consolidated Mfg. Co..... 70
Continental Motor Mfg. Co..... 55
Covert Motor Vehicle Co..... 71
Cox Brass Mfg. Co..... 65
Cramp, Wm., & Sons, Ship & Engine Building Co. 69

D

Dayton Auto Truck Co..... 70
Dayton Rubber Mfg. Co..... 55
Dean Electric Co..... 13
Detroit & Cleveland Navigation Co.... 72
Diamond Rubber Co..... 69
Double-Fabric Tire Co..... 60

E

Electric Welding Products Co..... 58
Empire Automobile Co..... 71
Empire Tire Co..... 68

F

Fedders Mfg. Works..... 72
Federal Miniature Lamp Works..... 56
Federal Rubber Mfg. Co..... 58
F. I. A. T..... 70
Fire Proof Garage Co..... 53
Firestone Tire & Rubber Co..... 11
Ford Motor Co..... 71
Franklin Automobile Co..... 16

G

G. C. A. Mfg. Co..... 67
Goodyear Tire & Rubber Co., The.... 56
Grant-Lees Machine Co..... 55
Great Northern Hotel..... 62
Grossman Co., Emil..... 55

H

Hartford Auto Parts Co..... 1
Hartford Suspension Co..... 8
Havers Motor Car Co..... 66
Haynes Automobile Co..... 70
Henderson Motor Car Co..... 66
Hodge & Graves..... 69
Hupp Motor Car Co..... 71
Hyatt Roller Bearing Co..... 15
Hydraulic Pressed Steel Co..... 69

I

Ignition Starter Co..... 55
Inner Shoe Tire Co..... 56
International Accessories Corp..... 67
Inter-State Automobile Co..... 65
Invincible Starter Co..... 67

J

Jeffery-Dewitt Co. 10
Jencick Motor Corp..... 65
Jones Speedometer 72

K

Kellom & Co., Chas. F..... 56
Kelly-Springfield Tire Co..... 55
King Motor Car Co..... 65
Kinsey Mfg. Co..... 68
Kissel Motor Car Co..... 68
Kline Motor Car Corp..... 66
Knight-Davidson Co. 68
Knox Automobile Co..... 6
Krit Motor Car Co..... 12

L

Lauth-Juergens Motor Car Co..... 63
Leather Tire Goods Co..... 55
Locomobile Co. 56
Lovell-McConnell Mfg. Co., Inside back cover

M

McCue Co. 4
McGraw Tire & Rubber Co..... 55
Mais Motor Truck Co..... 66
M & P Electric Vehicle Co..... 65
Mayo Radiator Co..... 3
Metz Co. 56
Michelin Tire Co..... 51
Michigan Buggy Co..... 68
Miller, Chas. E..... 3
Moline Auto Co..... 64
Mosler & Co., A. R..... 53
Moss Photo Engraving Co..... 62
Motor Car Equipment Co..... 56
Mott Wheel Works..... 72
Motz Tire & Rubber Co..... 56
Mutty Co., L. J..... 56

N

National-Acme Mfg. Co..... 53
National Gas Engine Starter Co..... 14
National Motor Supply Co..... 53
National Motor Vehicle Co..... 71
New Departure Mfg. Co..... 64
New Process Rawhide Co..... 72
Niagara Sales Co..... 56
Nordyke & Marmon Co..... 53

O

Oakland Motor Car Co..... 71
Owen & Co., R. M..... 56

P

Penn Spring Works..... 55
Perfection Spring Co..... 55
Piel Co., J..... 53
Pittsfield Spark Coil Co..... 67
Prest-O-Lite Co. 55
Pullman Motor Car Co..... 5

R

Rajah Auto Supply Co..... 67
R. C. H. Corp..... 9
Remy Electric Co..... 63
Republic Rubber Co..... 55
Royal Equipment Co..... 69

S

Sanford Motor Truck Co..... 60
Schrader's Sons, A., Inc..... 59
Shawmut Tire Co..... 70
Sheldon Axle Co..... 2
Sparks-Withington Co. 55
Speedwell Motor Car Co..... 71
Splitdorf Electrical Co..... 69
Springfield Metal Body Co..... 56
Standard Roller Bearing Co..... 56
Stearns Co., F. B..... 64
Studebaker Corporation.....Back cover

T

Timken Roller Bearing Co..... 7
Tobias, F. H..... 55
Twitchell Gauge Co..... 61
Typhoon Signal Co..... 55

U

United Rim Co..... 72
United States Tire Co..... 64
U. S. Motors Co.....Front cover

V

Valentine Co., J. H..... 62
Volkmar Auto Starter Co..... 69

W

Warm Hand Steering Wheel Co..... 57
Warner Gear Co..... 60
Warner Instrument Co..... 62
Weed Chain Tire Grip Co..... 56
Western Motor Co..... 66
Whitney Mfg. Co..... 61
Willard Storage Battery Co..... 63
Willys-Overland Co., The..... 18

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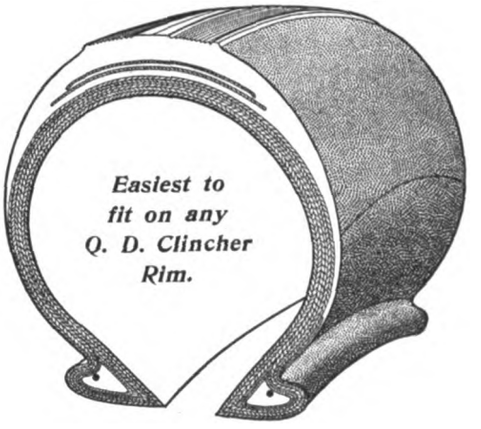
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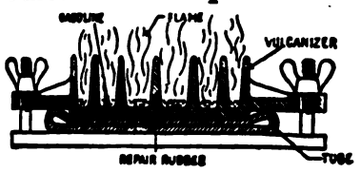


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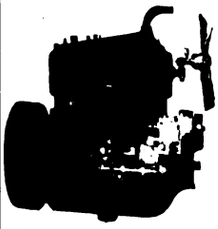
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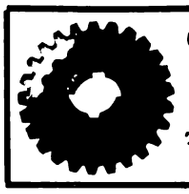
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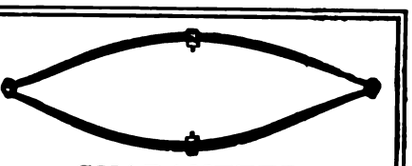
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That's what the INNERSHU accomplishes. It's a tough, durable, rubberized fabric formed permanently to tire shape. Ask for circular.
INNER SHOE TIRE COMPANY
Front Street Grand Rapids, Mich.

Auto-Top Fabrics
OF EVERY DESCRIPTION
SAMPLES AND PRICES ON REQUEST
L. J. MUTTY CO., Boston

GOODYEAR
AKRON, OHIO.
This name on Automobile Tires and Rubber Accessories signifies inherent qualities of material and workmanship that insure the maximum of service at the minimum of expense. (673)
The Goodyear Tire & Rubber Co., Akron, Ohio

MAZDA LAMPS
FEDERAL MINIATURE LAMP WORKS
of the General Electric Co.
Cleveland and Chicago

Locomobile Cars for 1912
Complete information furnished on request.
The Locomobile Company
BRIDGEPORT, CONN.



MOTZ Cushion Tires
For Pleasure Cars and Light Delivery Cars
Send for Booklet 58
THE MOTZ TIRE AND RUBBER CO.
Executive Office: Akron, Ohio

A—Shows *double*, notched treads.
B—Shows undercut sides.
C—Shows slantwise bridges.
D—Shows absorbing means when passing over an obstruction.

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900 Woodward Ave., Detroit
900 E. 15th St., Kansas City
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Standard Tire & Rubber Co., 104-106 Portland St., Boston
Distributors for New England States

Argo Electric
For the Gentleman and Gentlewoman
Beautifully Finished – Perfectly Equipped Easily Operated
Send for the new Argo Electric Catalog.
ARGO ELECTRIC VEHICLE CO., Factories, Saginaw, Mich.
Metzger-Herrington Co., Distributors,
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THE MOTOR CAR EQUIPMENT CO.
The Only Exclusive Wholesale Automobile Supply House
Write for Our Complete Catalog and Revised Discount Sheet
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The NIAGARA Self Starter
Is "As Dependable as Niagara"
Simple as It Is Efficient
Good Territory Open
THE NIAGARA SALES COMPANY
704 Main Street Buffalo, N. Y.

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Here is an accessory that does away with the terrors of cold during winter driving.

The Warm Hand Wheel will keep your hands and feet just as warm in zero weather as they would be if you were driving this minute.

The Warm Hand Wheel not only makes winter driving comfortable but it eliminates the danger of accidents due to cold, benumbed hands—also, hands heavily bundled up to keep out the cold.



WITH

We can supply you, or your customers, with the Warm Hand Wheel. Be a "progressive"—don't "stand pat" and handle a car that is so far behind the times as not to be equipped to warm the person who is driving it.

WARM HAND WHEEL

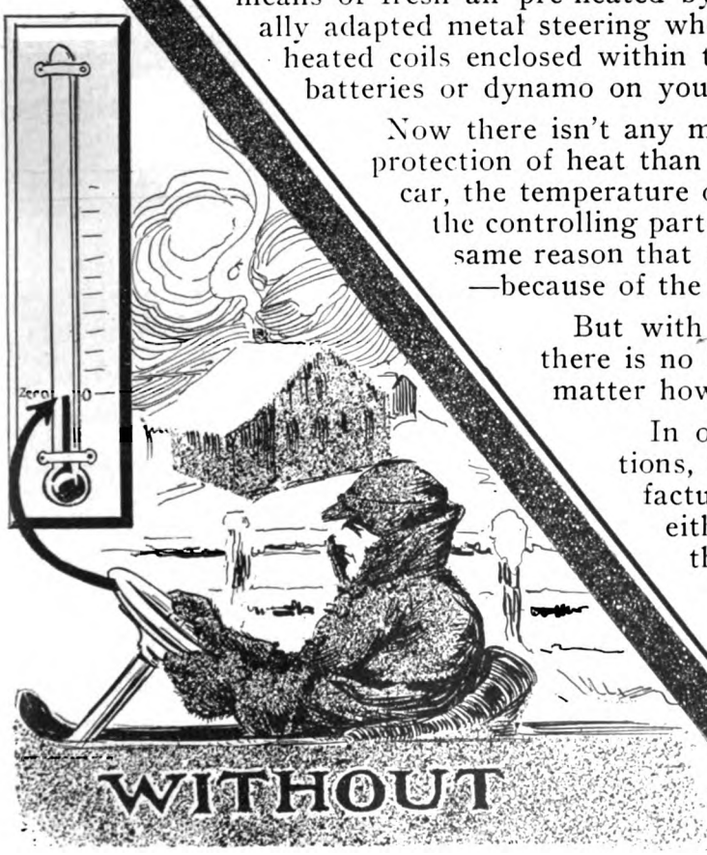
Insist upon heated steering wheels for winter driving. Not only do they mean safety and comfort—but they mean more cars sold in winter. If the manufacturer will not supply them write us and we will tell you how to get them on your cars.

The Warm Hand Wheel is a simple device which operates either by means of fresh air pre-heated by the motor and supplied to the specially adapted metal steering wheel; or, by means of a pair of electrically heated coils enclosed within the steering wheel and operated by the batteries or dynamo on your car.

Now there isn't any more sense in driving in winter without the protection of heat than there would be of riding in a Pullman palace car, the temperature of which was zero. The question of heating the controlling parts of an automobile has been neglected for the same reason that many other refinements have been neglected —because of the rapid growth of the industry itself.

But with the perfection of the Warm Hand Wheel, there is no longer any excuse for aught but comfort no matter how cold the weather may be.

In order to meet the requirements of all conditions, the Warm Hand Wheel is now being manufactured so as to be operated, as stated above, either by means of fresh air so circulated around the motor as to become thoroughly heated; or by using electricity—whichever system is best suited to the particular requirements of your car.



WITHOUT

Warm Hand Steering Wheel Co.
527 Fifth Avenue **NEW YORK**

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FEDERAL TIRES

Are Entitled to a Trial

FEDERAL Tires are now permanently used by many automobilists, because they have tried these tires on the strength of our claims of their superiority.

Federal Tires will demonstrate in every instance that they are worthy of their reputation as the tires of "Extra Service." They are more satisfactory and last longer than other tires. Try these unusual tires and note the economy.

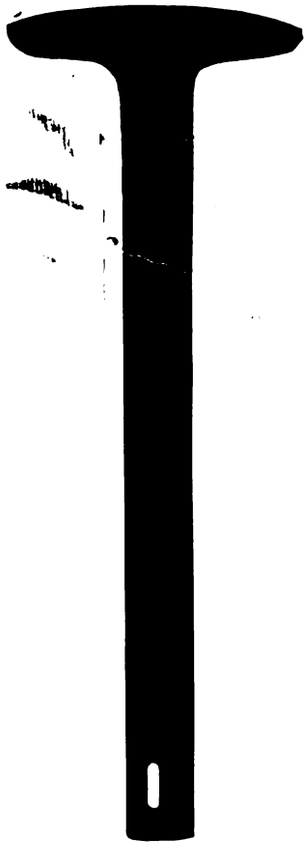
Made in all types for all standard rims.

Federal Tires are supplied through leading dealers everywhere. An interesting tire book mailed to all who write.

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Branches and Agencies:— *New York, Boston, Chicago, Kansas City, Minneapolis, Denver, Indianapolis, Columbus, St. Louis, Louisville, Omaha, Houston, San Antonio, Little Rock, Atlanta, Los Angeles, San Diego, Pasadena, New Orleans, Portland.*

"Extra Service"



THINK THIS OVER

very carefully and read it twice, if necessary.

Is there any part of an automobile engine, or any other gas engine, that is more important to its efficiency than a Valve?

Your engine leaves the factory running smoothly and sweetly—tuned up to its highest power. Perhaps the valves pit—warp—go out of shape—fail to hold compression. Then the power diminishes, and what can be more aggravating to the driver, who has known the fullness of the pulling power of his motor, than to have it grow less and less?

You cannot slight this part by putting in an inferior product—valves that will give trouble, or even break from inexperience in their manufacture—valves of unsuitable material, not suitably heat treated.

Too much is at stake, and a slight extra cost at the outset, which is the exception, may save you many times over a probable later expense.

This Company, with the experience of many years as a guarantee, will furnish you with properly made valves, of the materials best adapted to your requirements.

Not only QUALITY, but efficient SERVICE is a factor—surely there is a satisfaction in getting the kind of work you want—when you want it.

THE ELECTRIC WELDING PRODUCTS COMPANY

CLEVELAND, OHIO

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Mr. Automobilist:

Your tire maker is very anxious to impress upon you the importance of

Tires Inflated to the Right Pressure

He insists that this is tire economy and

Saves You Money

How do you know what pressure you have in your tires? A

SCHRADER
UNIVERSAL
Tire Pressure Gauge

(Trade Mark Registered in U. S. Patent Office)



(Patented March, 1898—Other Patents Pending)

will tell the exact pressure in your tires at any time, day or night, by simply holding this Gauge to your Valve for a second. Its recording sleeve remains in place, showing the exact pressure in the tire so that the Gauge can be taken anywhere and read, at night to the front of the car into the light of the lamps. After the pressure has been ascertained the Indicating Sleeve can be pushed back into the Gauge with your finger. No catches or snaps to operate or get out of order. This Gauge is 2½ inches long over all, short enough to apply easily to the smallest diameter of wheel and can easily be carried in the vest pocket or the change pocket of your trousers.

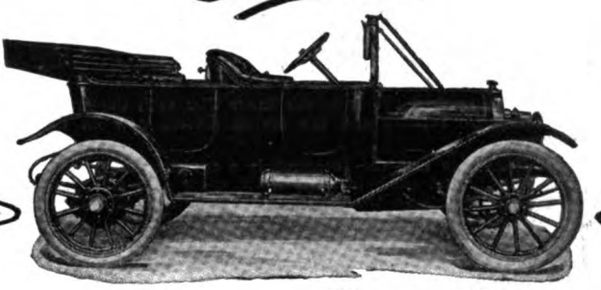
Price $1.00 Each
Ready for Delivery Now

Guaranteed Simple and Absolutely Accurate

Can be obtained from all tire manufacturers and the dealers, or

A. SCHRADER'S SON, Inc.
28-32 Rose Street New York City

4 Square Reasons Why You Should Choose the Glide



Our New Model 36-42 H. P.

Complete Equipment

$1550

The careful buyer, and the dealer who is alive to the real automobile situation are invited to write for handsome FREE book and learn from this book why the Glide is ***best.*** Booklet pictures and describes full line including Two and Four-Passenger, 45 H. P. Cars, $2,000; Five-Passenger "45," $2,150; Seven-Passenger "45," $2,250.

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For style, comfort, luxury, quality of construction, mechanical perfection—in all that goes toward a car's efficiency—the buyer of a "Glide" actually gets more automobile value than can be obtained from cars costing at least $1,000 more.

SERVICE
The "Glide" is not the only first-class car on the market, we admit that. But unlike other automobiles, the "Glide" is not merely a "one-year" car. We make the "Glide" for 5 to 7 years' continuous service. This we guarantee.

PRICE
While the "Glide" is not a high-priced car—remember it is not a cheap car. The standard of construction equals that of cars costing the highest price. Consequently the buyer gets a car second to none in quality at a cost that's as low as any standard make.

GUARANTEE
The purchaser of a "Glide" is protected by a guarantee more liberal and wider in scope than any other guarantee ever issued. Read it in the FREE book—sent on request. It will surprise you.

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are now being established in select territory. If interested, write us for our special proposition. "Glide" dealers can offer their trade a car that combines quality and service that at the price has never been equalled. Get this FREE book and full details.



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We make cars of all kinds for all occasions and purposes. FREE book pictures and describes the full line, send for it.

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INNER TIRE

Interlock

INTER LOCKING FLAP

Inner Tire

¶ Don't confuse the Interlock Inner Tire with the multitudinous reliners and tire saving devices now on the market.

¶ Remember that the Interlock is a complete inside tire, quickly and easily inserted in the outer shoe and guaranteed to withstand the hardest kind of treatment without danger of blow-outs.

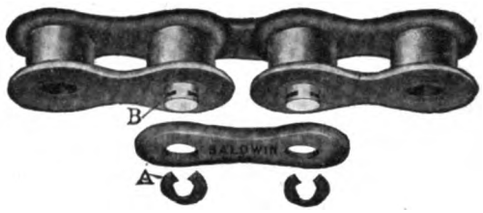
¶ The fabric used in the construction of the Interlock is 4, 5 or 6 ply, according to the size of the tire.

¶ With it blow-outs, rim-cuts, or punctures are practically impossible and as money savers they have made records that are almost unbelievable.

¶ Get the full details. We have some interesting literature which describes the Interlock Inner Tires in full.

¶ As a dealer it will pay you to know more about this tire saver—also about our liberal commission.

Double-Fabric Tire Co.
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Baldwin Drive Chains

BOTH DETACHABLE AND RIVETED

are used by the largest, most exacting users of chains for automobiles in the world. They need no further recommendation.



SPROCKETS We are equipped to make sprockets in large quantities at interesting prices.

Baldwin Chain & Mfg. Co.

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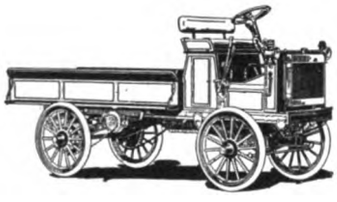
AGENTS

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Sanford

Sanford one-ton trucks are built by experts in one-ton truck construction

Chassis $1600



Stake or Express Body $1750

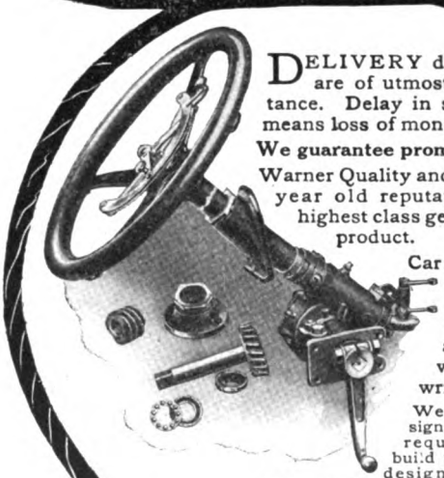
Sanford trucks are the product of the finest of materials, the most skilled workmanship and nine years' experience in designing and constructing one-ton trucks.

Sanford trucks are built with a view of harmonizing delivery cost with general business economies. Their design, their construction and, consequently, the service they render make Sanford trucks the easiest selling one-ton trucks on the market.

Don't wait until our agency is at a premium in your territory—get it now.

The Sanford Motor Truck Co.
SYRACUSE, NEW YORK

Dependable Deliveries



DELIVERY dates are of utmost importance. Delay in shipments means loss of money.

We guarantee prompt deliveries.

Warner Quality and Warner eight-year old reputation for making highest class gears is back of the product.

Car makers interested in the Quality and Merit that means absolute safety and satisfaction will do well to write.

We modify our designs to meet detail requirements, or build to approved designs on seasons quantity specifications.

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Warner Gear Co.
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The New Twitchell Positive Lock Stop Gauge

There are many types of Gauges on the market, but do you really know of any that are accurate?

We Know Your Answer

Now listen to what we have to say about the NEW TWITCHELL POSITIVE LOCK STOP ACCURATE GAUGE:

1—Correct pressure is insured in all your tires.
2—Its construction is simple.
3—No rubber washers to wear out or deteriorate as in all other Gauges.
4—Absolutely no friction or wear on internal or external parts.
5—In testing this Gauge it passes through four different hands, the last test being inspection.

GET MILEAGE! Correct pressure, and pressure in all your tires are essential to your mileage.

The use of the new Twitchell Air Gauge enables you to attain this. IT IS ACCURATE, SIMPLE AND INSTANTANEOUS, made to carry in the vest pocket and is only 3½ inches long.

No better tire insurance could be produced than a LOCK STOP FEATURE TWITCHELL AIR GAUGE. It can be just as easily read at night as day—the graduated bar remains at the pressure indicated until a slight pressure of the thumb on the extreme end of the ratchet side returns the register to zero.

Correct Pressure for Tires:		
2½"	Tires.....	50 lbs.
3"	Tires.....	60 lbs.
3½"	Tires.....	70 lbs.
4"	Tires.....	80 lbs.
4½"	Tires.....	90 lbs.
5"	Tires.....	90 lbs.

THE TWITCHELL AIR GAUGE IS TIRE INSURANCE FOR ONE DOLLAR.

Can be Obtained from Your Dealer.

THE TWITCHELL GAUGE CO., 1256 Michigan Blvd., Chicago. Ill.



"WHITNEY" CHAINS

Are Used by the Leaders

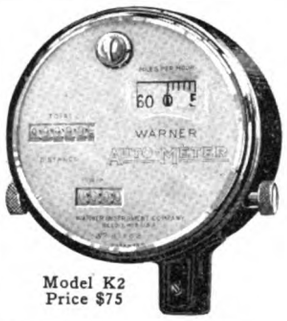
Look for the Cotter Pins

The Whitney Manufacturing Co.

HARTFORD, CONN.



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Model K2
Price $75

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AUTO-METER

FOR 1913 the Warner Auto-Meter is the choice of the largest automobile manufacturers in the world. This coming season it will be found on over 100,000 new cars. It is the most highly developed and most accurate speed and mileage indicator the world has yet produced.

Prices from $50 to $145. For sale by dealers all over the world and at our own branches.

Handsome catalogue on request.

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Self Starter HANNA A

Watch the Prices Drop!

Just as the Hanna self starter—the only 100% efficient self starter that does not foul or soot your plugs—was imitated by those who followed our lead so now is the price of the Valentine manifold starter being met.

Remember We Were the Originators

Not only were we the first to produce an acetylene self starter but we were first to introduce a manifold self starter at the right price, $10.

Our Price Does Not Cut the Dealer's Profit

Still some fine territory open. The profit is big. Our goods are right and fully guaranteed. Write today.

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The Valentine STARTER MANIFOLD and Gas Lighter

Great Northern Hotel
CHICAGO

Ideal Headquarters for Automobilists

Rates:
Without Private Bath
$1.50 and $2.00
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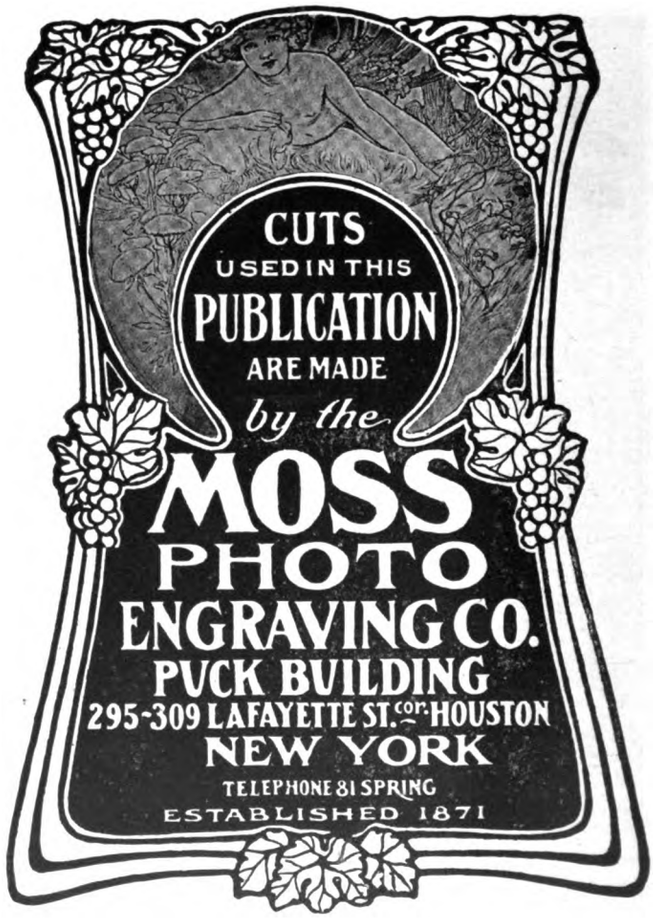


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Service and Appointments Most Approved

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A Safe and Satisfying Purchase

Ajax Tires have made world's records. They are built to endure. They have been put through every test and came out with flying colors.

Success in making tires is not within the grasp of everyone who tries. We have studied every detail of advancement in the constant process of evolution in tire making and our ideals have been fulfilled. Ajax Tires today are absolutely the leader—the greatest value ever offered to the public—every tire guaranteed for 5,000 miles.

DEALERS

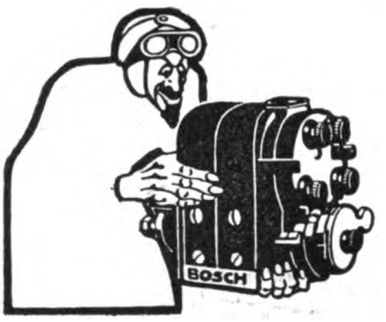
If you want tires that are built right and priced right to meet every demand of your customers and have them satisfied—enabling you to build up a permanent business and acquire prestige—write today for our latest proposition.

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Efficiency Wins

AT Tacoma, Wash., the Free for All, the Heavy Car, and the Medium Car Races were Bosch Victories—*of course.*

Be Satisfied **Specify Bosch**

BOSCH MAGNETO COMPANY

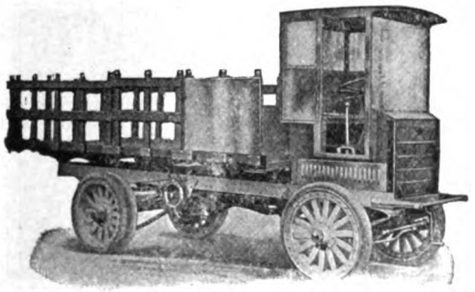
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ONE, TWO AND THREE TON CAPACITY



LAUTH-JUERGENS TRUCKS ARE THE LATEST IN CONSTRUCTION, most powerful in operation and the motors are guaranteed against defective workmanship and material for the life of the truck. They are positively the highest class trucks made. Two cylinder, one-ton, four cylinder, one, two and three-ton. Four speeds forward. Hess-Bright ball bearing transmission made in our own shops of the finest tool steel, three-piece disc clutch, covered by patents owned by us. Send for 1912 Catalog and specifications. Prompt delivery on all models. Large publicity campaign just begun. Our quality will do the rest.

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Exchange Your Old Magneto for a New Remy

IT will cost you practically no more than what you will be forced to pay out for constant repairs on your present ignition system. A new Remy will give your car new life. Here is our exchange proposition:

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4-Cylinder Remy Magneto with Coil, complete.....	50 00	10 00	40 00
6-Cylinder Remy Magneto with Coil, complete.....	52 00	10 40	41 60

Allowance made for any make of Magneto.

Remy Electric Company

Anderson, Indiana

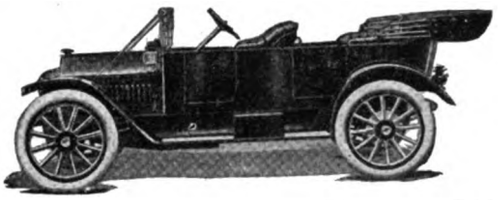
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THE phenomenal records made by the "Dreadnought" Moline "35" in winning four great Glidden, Reliability and Economy Tours in the past two seasons have left an impression of "quality" that is publicly recognized wherever and whenever you drive the MOLINE—the car with the famous

4x6 Long-Stroke Motor

Write for Catalog, Edition de Luxe, showing the four new Foredoor Self-Starting Models—Five-Passenger Touring, Four-Passenger Roadster and Two-Passenger Roadster.

Prices, $1600 to $1700 [xx]

MOLINE AUTOMOBILE CO.
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Dealers, Why Not Sell "A Car That Sells"? Write.

Schafer Ball Bearings

are standard on America's leading cars—in fact the specification "Schafer Ball Bearings" is a sure indication that the car in question is "quality built."

Made of chrome steel of exclusive analysis, these bearings are free from blisters, air bubbles and other flaws that tend to weaken the structure or develop a variance of size, shape and weight.

The car that is "Schafer equipped" is free from friction trouble and consequent wear in the hardest worked and most important parts.

Barthel, Daly & Miller
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"American Made for the American Trade"

New Departure Guaranteed Ball Bearings

are in 60% of the 1912 cars. Contracts for 1912 cover 80% of the entire output of American automobile manufacturers next year. Reason—New Departure Ball Bearings have "made good." Have you had our 1912 catalog?

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THE ULTIMATE CAR
(KNIGHT TYPE MOTOR)

The first American Car to adopt the Silent Knight Motor—the engine used by Daimler, Mercedes, Panhard and Minerva.

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Branches and Dealers in 125 Cities

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ARE GOOD TIRES

B & L CASTER FRONT AXLE

Means to you as a car owner—SAFETY, EASY STEERING and PERFECT CONTROL. Agents should insist that their 1913 cars be equipped with it.

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¶Since the introduction of BENZ cars to the motoring public of America, agencies have been desired, in fact, coveted by many. We are now in a position to offer agency propositions to responsible parties. ¶Also makers of the famous BENZ-GAGGENAU six ton trucks. Choice territory open for agents. Write us today for full details.

BENZ AUTO IMPORT COMPANY OF AMERICA
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"Distinctly Complete"

Electrically Self-Started and Lighted — Inter-State — Six Models 40 and 50 H. P. Fully Equipped

Model 40—5 Passenger, Fore Door Touring Car.
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Model 50—7 Passenger, Fore Door Touring Car.
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Fully equipped with top, windshield, speedometer, gasoline gauge, 36" wheels, demountable rims, and automatic tire pump.

All fully described in our Art Catalog. Send for one today.

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OF QUALITY

FOR MOTOR TRUCKS

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Price $20 Without Cylinder Attachments

"The Crankless" STARTER

By adding an injector and cylinder attachments the crankless starter becomes absolutely perfect—100% efficient. For 4 cylinders the extra attachment costs $10, for 6 cylinders, $15.

Guaranteed by our 40 years standing and reputation.

COX BRASS MFG. CO. Established 1872 Albany, New York

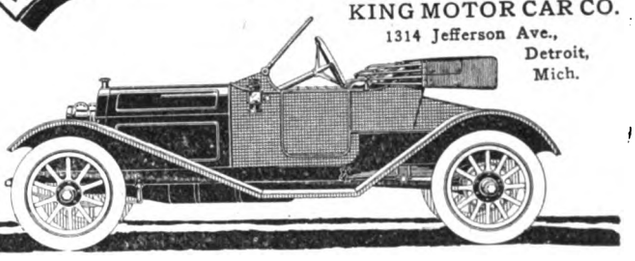
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This new King Roadster is truly "King of the road." Its silent motor gives full 36 horsepower, and has the speed and flexible control that experienced drivers demand.

With Full Equipment, Including Self-Starter, $1190

Terms, territory and detailed description on request.

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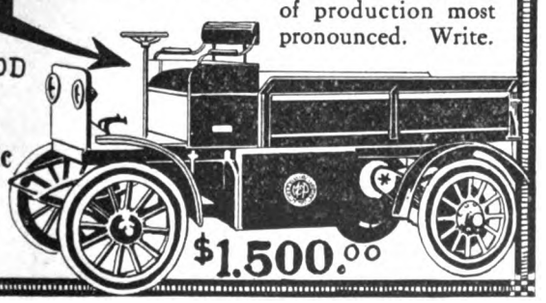


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DEALERS—Here is the first electric truck that sells for about $700 less than any other. Capacity 1000 pounds—Service 100 per cent. more than gasoline truck—Economy of production most pronounced. Write.

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Franklin and Dubois Sts.
DETROIT, MICH.



$1,500.00

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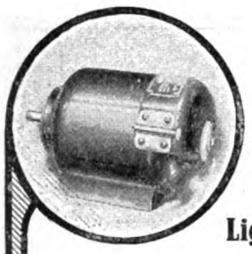
This name stands for efficiency in

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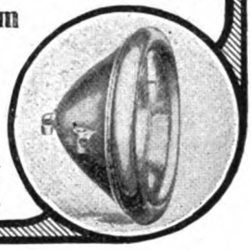
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HAVERS - SIX - HAVERS MOTOR CAR CO.

Havers Self-Starting "Six-44"



Price $1850

SPECIFICATIONS TALK—Six-cylinder Motor, 4-cycle long-stroke type; 44 H. P.; Bosch Magneto; dual system; Model "C" Stromberg Carburetor. 122-inch wheel-base; 36x4-inch wheels; self starter. Springs, semi-elliptic front, platform suspension, rear; rear axle, full floating type.

Full specifications sent on request.

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A prudent buyer in selecting an automobile of permanent utility seeks the security of an established guarantee.

4 and 6 Cylinder Motors
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4 Speeds Forward
Self-Starting
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One Quality in All Models

4-30 $1700 $1750 4-40 $2200 $2250 6-50 $2800 $2950 6-60 $3300 $3500

Agents wanted in open territory. Write today.

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Factories: York, Pa., Richmond Va.

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Internal Gear - Not Chain—1½ and 2½ Tons

THE MAIS AGENT figures his profit when a truck is sold. It is not a modified pleasure car, but is built in factories for trucks only. Its maintenance expense is no more year after year than when first demonstrated. Its parts are interchangeable, you don't need a machine shop. All parts enclosed and lubricated.

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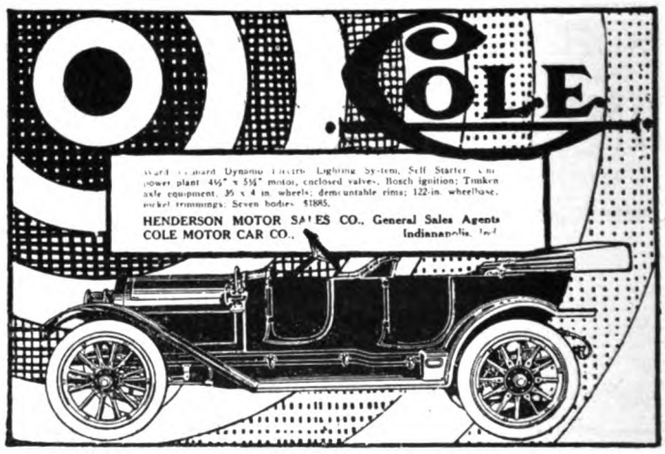
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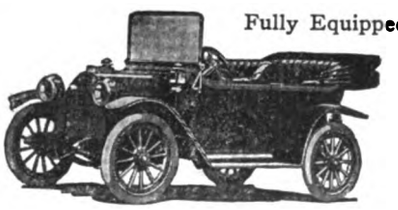
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The Detroiter—$850

Fully Equipped

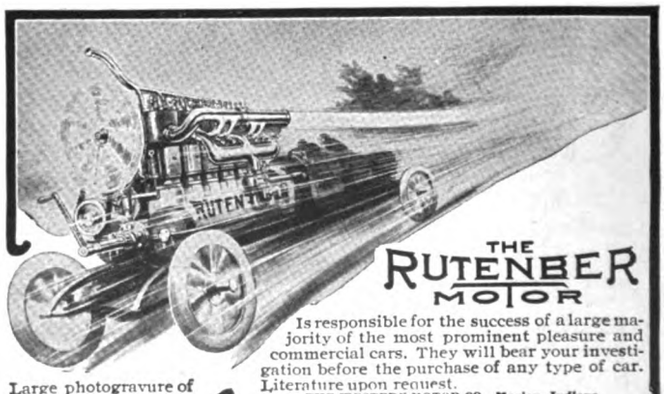
Five Passenger Touring Car



25 H. P. Long Stroke Motor

Enclosed Valves, Three Point Suspension, Unit Power Plant, Platform Rear Springs, Full Floating Axle, Left Hand Drive, Center Control, Drop Frame, Large Tires, Complete Ball Bearing Car. Write for specifications.

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START YOUR CAR FROM THE SEAT
ALWAYS READY AND POSITIVE

The AMERICAN STARTER is the Only Starter on the market that measures the amount of gas injected into the cylinders. You cannot "dope" the engine with the AMERICAN STARTER.

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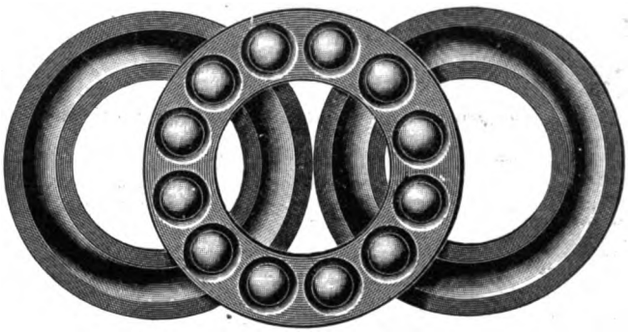
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It will save you 20 per cent. in gasoline, increase power of motor 20 per cent. and is a positive preventive of carbonization.

How It Works—SPEEDO breaks up, under spray, each particle of gas after leaving carburetor, injecting additional air, automatically. Makes easy cold weather starting and is sold only Under Guarantee of Absolute Satisfaction. Ask your dealer.

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will start any four-cycle engine of four or six cylinders. Turn on the switch—that's all

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Every car owner in your vicinity, Mr. Dealer, will be interested—it's up to you to show them—and sell them. Write for booklet and dealer discounts.

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It has no moving wires on the armature, the coil being stationary in the rear of the magneto and water-tight. Not only is the retarded spark as efficient as the advanced, but our latest design is operated by a self-starting switch that makes cranking unnecessary.

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The Motor With the Sliding Crescent Valve
KNIGHT-DAVIDSON
1896 — 1912

The CRESCENT valve of the K-D Motor, fitting around the stationary piston wall affords a larger port area than any other poppet or slide valve on the market. It is simpler and, consequently, better than any other valve construction known and is here offered to discriminating manufacturers, not as an experiment, but as a tried, tested and proved mechanical advance. The K-D motor is simple, silent, cools rapidly, has the simplest oiling system known, will not carbonize. Last and most important, will give on a given quantity of fuel more power, speed and endurance, unit for unit, than any other engine on any type of an automobile. We want to present some facts to interested manufacturers.

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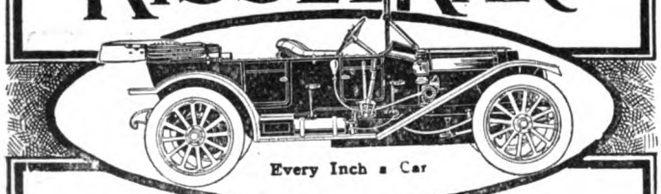
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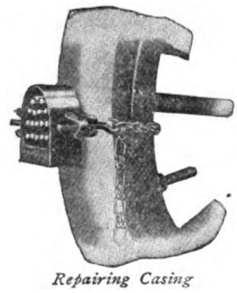


Every Inch a Car

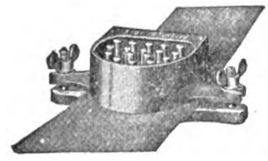
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TIRE CUTS ruin casings. They admit moisture to the carcass, cause the fabric to rot and weaken, grow larger-end in blowouts.

You can repair **CASINGS** and **INNER TUBES** anywhere in 15 minutes, better than a Repair Shop can do —and for *one cent.*

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Patented

A practical vulcanizing outfit complete, with enough repair gum to make 40 patches. It weighs 3 pounds and can be carried in the tool box. **Simplest and most satisfactory device for eliminating tire troubles that has ever been devised.**

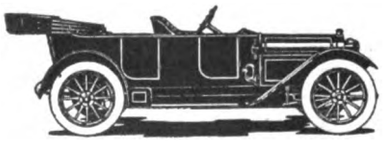
Absolutely automatic. Place the patch — attach the Vulcanizer — put in the gasoline — light it. No further attention required. In 15 minutes the job is done.

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40-Horsepower Touring Car or Roadster, absolutely silent in operation. Cylinders 4¼ x 5¼-in. — 116-in. wheelbase—34 x 4-in. tires—demountable rims—nickel mountings—massive, straight line body—big, roomy seats—proved self-starter—everything. Price $1500. Guaranteed for life by the Michigan Buggy Company. 40-horsepower Roadster on the same chassis. Two smaller models. Catalog on request. (83)

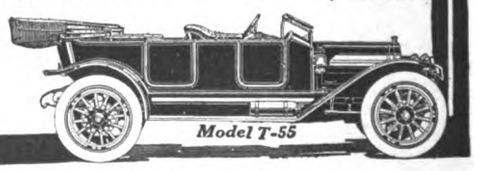
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Has more Horsepower and a longer Wheel Base than any other Four Cylinder Automobile in the World selling for this price **$1850**

Send for our Chart of Comparative Motor Car Values

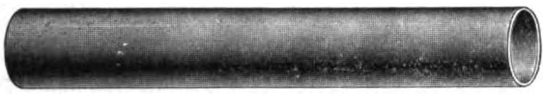
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All sizes from 1 inch to 3 1-4 inches diameter cored and solid bars kept in stock for immediate shipment. Order by wire. We will ship by express.

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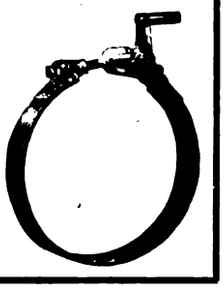
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Duplex brakes produce maximum safety. They are America's leading brakes. Made by brake experts. Nothing so necessary as "quick acting" brakes.

Get a set of DUPLEX brakes. Inexpensive—easily installed. We build brakes to order. Write us today. Let us quote prices. Send for complete catalog.



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Manufacturers of Raymond Brakes, Raybestos Brake Lining and Gyrex—The Mixer.

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Solars are made in all styles for oil, electricity, gas and in combinations.

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Seven Passenger, Fore-door Touring Car, fully equipped, less top, windshield and extra seats	$1800
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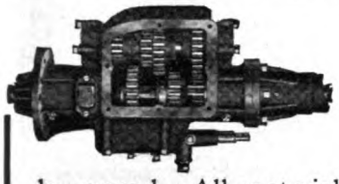
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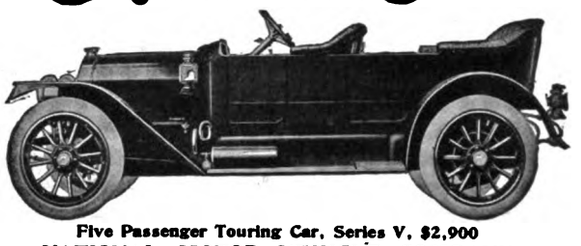


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THE UNIVERSAL CAR

Its lightest—rightest—most economical—that's the reason we'll make seventy-five thousand of them this year. Prices $590 to $900. Agencies everywhere.
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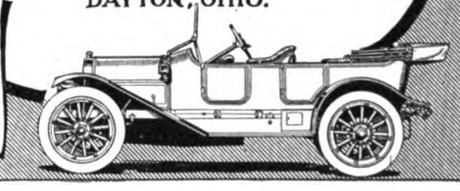
AMERICAN
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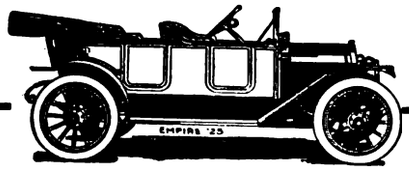
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THE SPEEDWELL MOTOR CAR CO.
DAYTON, OHIO.

TOURIST
4-Passenger
$2,700
Fully Equipped including Self-Starter





Empire Twenty-Five
"The Little Aristocrat"

This is the Big Brother of the Famous Empire Roadster and is a small edition of $5,000 cars.

Hence the price of $850 puts this car in a class by itself. Specifications prove the Empire 25 to be the most "aristocratic" little touring car in America. Write for details today.

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Hupmobile

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Touring Car
$900 F. O. B. Detroit

Motor 3¼ x 5½ inches; four cylinders; Bosch magneto; three speed sliding gears; tires 32 x 3½ inches; 106 inch wheelbase. Equipment includes windshield, gas headlights, generator, oil lamps, tools and tire repair kit.
Roadster body on same chassis and with same equipment, $900 F. O. B. Detroit.

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F. O. B. Detroit. Same power plant as World-Touring Car. Wheelbase, 86 inches. Equipment of top, windshield, gas lamps and generator, oil lamps, horn and tools.

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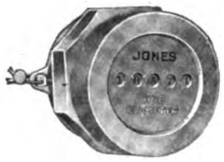
HUPP MOTOR CAR CO., 1254 Milwaukee Ave. Detroit, Mich.

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The HUB ODOMETER is attached to hub. Concealed so that it can't be tampered with or disconnected without owner's knowledge. Mileage always visible and instantly ascertained. Withstands most severe usage.



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AUTOMOBILE OWNERS AND TOURISTS

should break their journey and avail themselves of the excellent facilities afforded by the D. & C. Lake Lines, operating daily service between Detroit and Buffalo and Detroit and Cleveland.

Enjay the delights of the cool breezes from Lake Erie and resume your journey in the morning after a refreshing night's rest. Special attention given by this Company to the handling of automobiles. Rates quoted on application (state wheel base); Tanks of Automobiles must be emptied of gasoline before being shipped; three gallons of gasoline supplied free on arrival at destination.

Roads in this section of the country are in first class condition; new road now under construction between Detroit and Toledo. Tourists speak highly of the route between Buffalo and New York.

On your trip this summer bear in mind "The Waterway is The Only Way."

DETROIT & CLEVELAND NAVIGATION CO.,
General Offices, Detroit.

Standard Universal Rims



fit any style or make of tires. The side rings are reversible, they curve outward on one side to fit a straight side tire, inward on the other to accommodate a clincher. Two turns of a nut unlocks the rim for demounting, two more turns locks the rim in place. Write for catalog 607, which explains fully.



THE UNITED RIM COMPANY, Akron, Ohio

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KLAXON

The Name of the New Signal is

KLAXET

THE AWARD OF $100 was made to H. I. Stengel, Esq., Spring Lake, N. J., for the name "Klaxet."

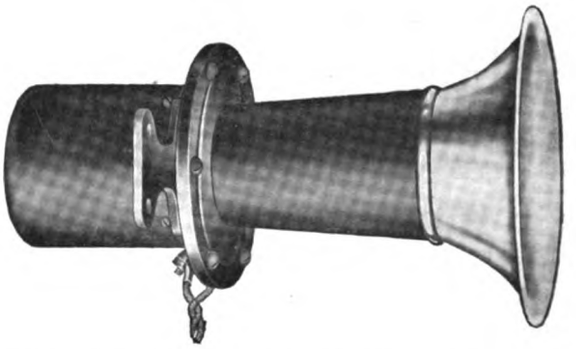
Several others submitted the same name, but the suggestion of Mr. Stengel was the first to be received.

"Klaxet" was chosen from the more than ten thousand other names submitted, for the following reasons:—

(1) It harmonizes consistently with "Klaxon" and "Klaxonet", and yet there is sufficient distinction to prevent confusion: The difference in appearance of "et" and "on" removes it from "Klaxon", its shortness from "Klaxonet".

(2) The source of the word "Klaxet" is at once apparent. It immediately brings to mind "Klaxon", and says without further explanation that the signal is made by the same makers. This point is valuable, because the word "Klaxon" is universally known. It is synonymous in the minds of the public generally with "automobile horn." "Klaxon" is the most valuable single trademark in the accessory field.

(3) "Klaxet" is short, easily remembered, easily handled in type.



MOTOR DRIVEN $12

COMPLETE WITH WIRE AND PUSH-BUTTON

THE name has been chosen. From August 15th orders will be accepted—and filled in the order of their receipt. Deliveries will begin on the first of September.

The advent of the Klaxet means the *certain elimination* of the bulb-horn!

It means a swift "revision" in the prices of signals of *other* types.

The Klaxet—perfectly made, fully guaranteed, invariably reliable—loud, abrupt, a *real warning*—economically operated; an *adequate* MOTOR-DRIVEN signal at TWELVE DOLLARS—will establish a new standard of signal values!



KLAXONET

Lovell-McConnell Mfg Company Newark, N.J., U.S.A.

KLAXON

"The Public Safety Signal"



KLAXON

KLAXONET

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Studebaker

The All Important Question of Repair Parts

Convenience in getting repair parts—their cost when he does get them—are serious questions to every car owner. These considerations alone make the "assembled" car a dangerous experiment.

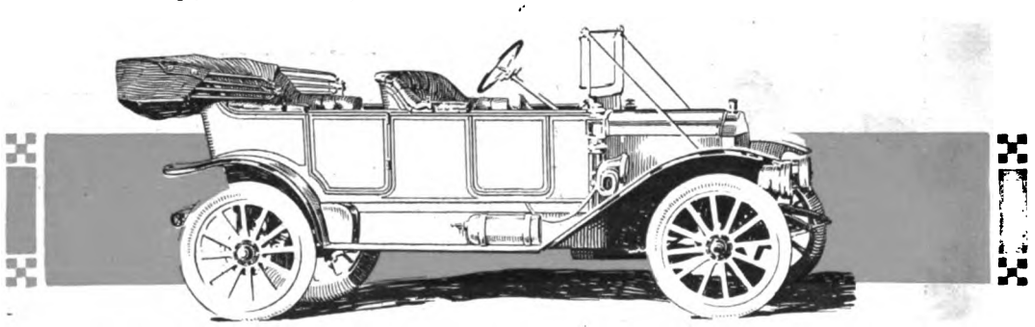
When he needs a new part, the owner of an "assembled" car has to wait for it—for days at least, perhaps weeks, perhaps months, and in addition to the annoyance and loss of time, face an expense bill out of all proportion to the actual value of the part.

Studebaker car owners have none of these troubles. Every car part is made in the Studebaker factories—made with automatic machinery which ensures absolute uniformity and precision and reduces cost to a minimum.

Change for the sake of novelty, moreover, has never been a Studebaker policy—and experience shows, that we have left little to improve and few mistakes to correct. Studebaker parts consequently do not vary and do not have to be made up specially from discarded patterns. With 36 Supply departments and 2000 equipped dealers over the country any part can be replaced at a moment's notice at very slight cost.

The quality of Studebaker parts, also, reduces the percentage of breakage to the lowest possible point. All material is tested for quality in our own laboratories and every part tested for strength at every step in its manufacture.

These are some of the facts that account for the clean, unrivaled record of Studebaker cars and their immense selling strength among dealers and owners.



The $800 Studebaker (Flanders) "20"

Equipped with Top, Windshield, Prest-O-Lite Tank and Speedometer, $885 f.o.b. Detroit

STUDEBAKER CARS

(Nickel Trimmed)

STUDEBAKER (FLANDERS) "20"		STUDEBAKER (E-M-F) "30"	
Touring Car	$800	Touring Car	$1100
Roadster	750	Detchable Demi-Tonneau	1100
Utility Car	800	Roadster	1100
Delivery Car	800		

See our dealer. You can get prompt delivery. Our Art Catalog A-9 is yours for the asking.

The Studebaker Corporation Detroit, Michigan

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THE MOTOR WORLD

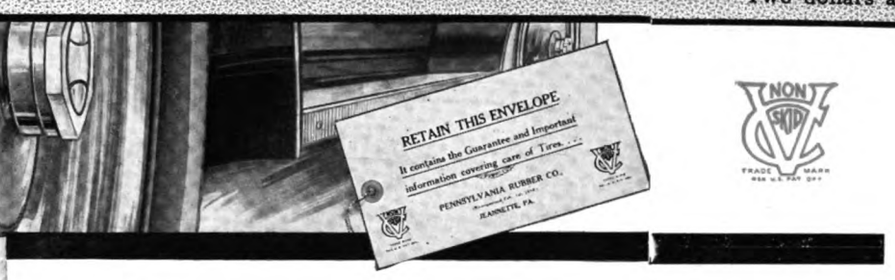
A Trade Paper Giving the World's Motor News

Vol. XXXII
No. 6

New York, August 1, 1912

Ten cents a copy
Two dollars a year





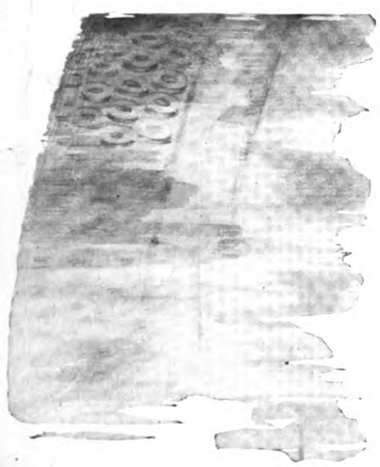
NON SKID
TRADE MARK

ANNOUNCEMENT

IT IS our policy to promote the sale of Pennsylvania Tires both by maintaining the highest possible standard of quality and by devotion to the Dealer's interests, in order that he may be assured of a fair profit for service rendered in distributing our products.

Our remarkable guarantees, and the fact that the tires have more than fulfilled those guarantees, have created such an enormous demand that we are now enabled to offer the trade the most attractive proposition we have ever made on

PENNSYLVANIA VACUUM CUP TIRES



Our extensive advertising has created a growing interest among motorists who had not been familiar with these tires, but who are now ready buyers.

As we distribute only through the highest-grade Dealers, there is an opportunity for many to secure practically a monopoly in the sale of Vacuum Cup Tires in districts in which we are not now represented.

To each tire is attached an envelope containing the definite printed guarantee of 4,000 miles actual service.

Purchase price refunded if a car equipped with Vacuum Cup Tires skids on wet or greasy pavements.

Write at once or call at nearest branch.

PENNSYLVANIA RUBBER COMPANY, Jeannette, Pa.
(Reorganized February 1st, 1910.)

Pittsburgh, 505 Liberty Ave. Chicago, 1004 Michigan Ave. Kansas City, 514 E. 15th St.
Cleveland, 1837 Euclid Ave. Detroit, 254 Jefferson Ave. Minneapolis, 34 S. Eighth St.

PENNSYLVANIA RUBBER CO. OF NEW YORK
New York City, 1700 Broadway

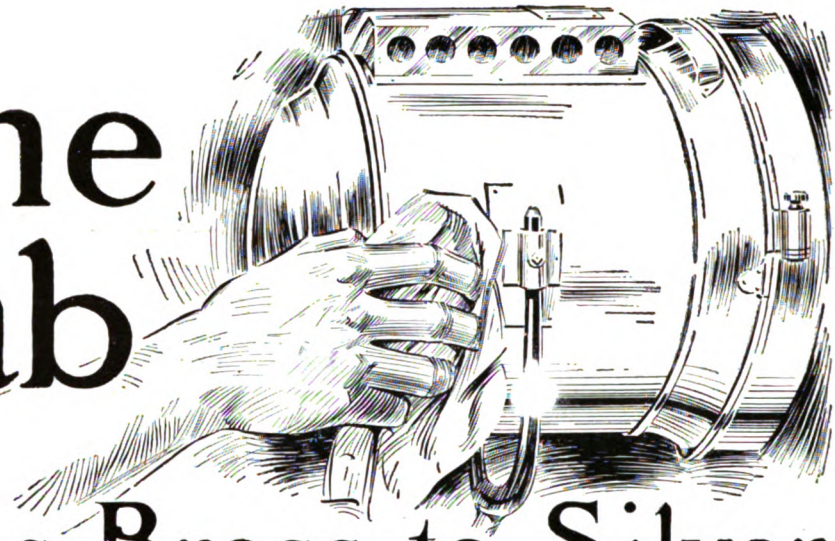
PENNSYLVANIA RUBBER CO. OF CALIFORNIA
San Francisco, 512-14 Mission St. Los Angeles, 930 S. Main St.

An Independent Company with an Independent Selling Policy

Published Weekly by The Motor World Publishing Company, 1600 Broadway, New York

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One Rub



Turns Brass to Silver

Talk about your nickel-plated lamps! In a few minutes you can *silver* plate every piece of brass and copper on your car. It is *actually easier than polishing* the brass. It does away with all polishing hereafter. All you need is a piece of cheesecloth and a bottle of

Trade **Silver Quick** *Mark*

One Rub
Turns Brass to Silver

$1.00 bottle will silver plate your whole car

Right now stick a dollar bill and your card in an envelope and mail to us for a bottle of SILVER QUICK. Silver plate every piece of bothersome brass on your car. Get away from that cheap, brassy look. Make your car as up-to-date as any 1913 model.

You can do it in a few minutes with SILVER QUICK, and say good-bye to polishing forever. SILVER QUICK is not mercury or quicksilver; it gives a genuine, lasting silver plate. long exposure has made the first coat du use SILVER QUICK again. It's easie polishing. $1.00 bottle will silver plate a work on any car. Send $1.00 now. You risk. We absolutely guarantee SILVER Q to *be* and *do* everything we claim for i will give you your money back if you e it.

Atlas Auto Supply Company, 93 East Adams St., Chic

Manufacturers of Tire-Doh, sold for three years on money-back guarantee—our policy.

A Reminder to send $1.00 to ATLAS AUTO SUPPLY CO. 93 East Adams Street, Chicago, for a bottle of *Silver Quick*

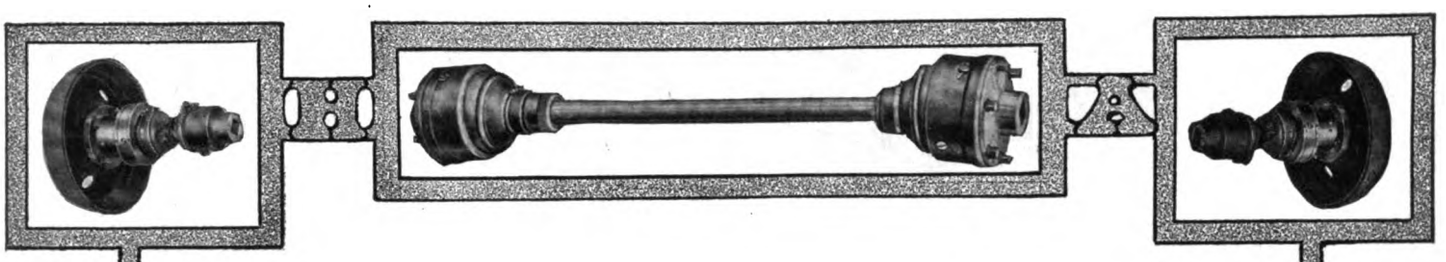


Clip the Coupon Now

You Can't Afford to Forget This

Dealers Wanted Everywhere.
Write Your Jobber or to Us.

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The grinding department of this plant is what may be well termed "different and better" for we have designed and built many of our own grinding machines to meet special and hard requirements, which could not be met on the ordinary run of grinders.

Every process involved in the making of universals and cone clutches conforms with unyielding precision and every part of every universal and cone clutch has a limit of tolerance far beyond the point that could be reached in actual working conditions.

It costs good money to produce parts that are stressed to the "Hartford" standard—but this works out for us as a reputation builder and for you, Mr. Car Manufacturer, as an assurance of quality that will do its part in establishing and holding your reputation.

Now, back of these claims, we can show you prices on quantity production that will make you wonder just how we do it.

We stand ready to tell investigative engineers just how experience, plus facilities, can produce cone clutches and universal joints good enough to make good cars still better.

J. S. BRETZ CO., New York, Detroit, Sole Selling Agents

CONE CLUTCHES

HARTFORD AUTO PARTS CO.
HARTFORD, CONN.

UNIVERSAL JOINTS

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EXPERIENCE — SHELDON — RIGHT DESIGN
FACILITIES — AXLES — RIGHT STEEL
"Made in the Largest Axle Factory in the World"

Axle Talk—No. XIII

SHELDON practice is exact.

SHELDON organization is just an assembly of scientific and engineering methods that must, of necessity, automatically throw out, reject and "scrap" any part of any axle that can't conform to SHELDON standard.

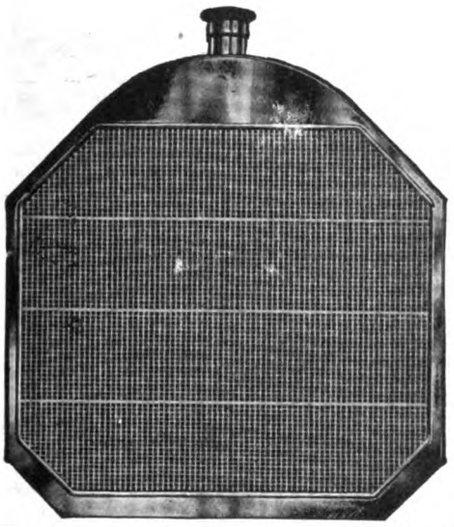
A physical laboratory, a chemical laboratory, an engineering staff composed of men who have made springs and axles a life study—modern instruments of research, consisting of testing machinery for materials, endurance machines to study the life of that which formerly was considered inert matter—chemical laboratories which study the biology and the pedigree of materials—machines for studying the strength of their products under static and dynamic forces. These, and many other appliances too numerous to mention, have replaced and added to their hold of new methods of production.

If SHELDON methods of getting only the best out of materials and construction appeal to any engineer who has been up against it in this particular, then he's the man we want to talk to.

SHELDON AXLE COMPANY, Wilkes-Barre, Pa.

CHICAGO OFFICE—68 East 12th St. DETROIT OFFICE—1215 Woodward Ave.

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The Mayo—the radiator thoroughbred

¶ A cheap radiator always lives up to its cost reputation and initial economy in this direction is simply an investment in trouble and repair bills.

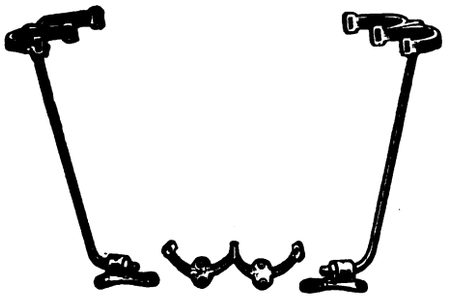
¶ Mayo Radiators are not cheap—either in cost price or construction, but they are gilt edged insurance against breakage, leakage and insufficient radiation. And this means that they are factors for economy, service and satisfaction considered.

Mayo Radiator Company
NEW HAVEN, CONNECTICUT

The Largest Antomobile Snpply House in America

FIFTEEN STORES IN THE UNITED STATES

"Torpedo" Tire and Demountable Rim Holders



Designed especially for use on Torpedo body or Fore-door cars. Set consists of two strong arms firmly bolted to running board and permitting of sufficient adjustment to accommodate two tires or demountable rims, of standard sizes, 4 inch or smaller. Made of solid Brass and guaranteed to give perfect satisfaction.

Finish: Furnished in Hard Rubber Black Enamel finish, and full Polished Brass.

	Brass	Black
Price, complete with Straps...	$4.00	$3.00

A dozen other styles and sizes in stock. See catalog.

Our 1912 Catalog, which is held as a book of reference by manufacturers, dealers and automobile owners, will be mailed on request. Circulation limited to 100,000 copies.

Chas. E. Miller

MANUFACTURER, JOBBER, EXPORTER AND IMPORTER

HOME OFFICE

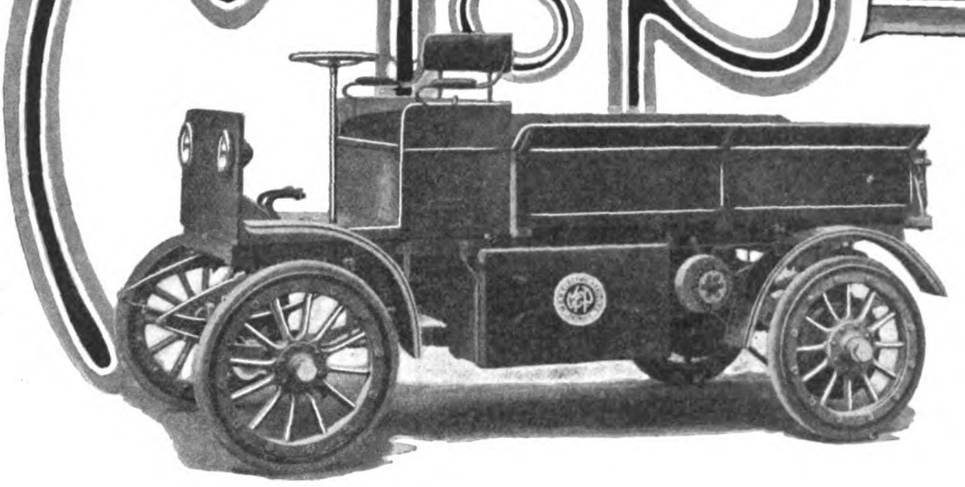
97-99-101-103 Reade St., New York City

ORDER FROM NEAREST BRANCH, ADDRESS CHAS. E. MILLER

NEW YORK CITY—97-103 Reade St.
NEW YORK CITY—924 Eighth Ave.
NEW YORK CITY—2782 Broadway.
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SPRINGFIELD, MASS.—Bridge and Dwight Sts.

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The M & P Electric



PRICES:

Chassis
$1450

Express Body
$1500

Enclosed Body
$1600

THERE is no doubt but that thousands of concerns prefer the electric truck to the gasoline type, but up until this time they have been balked through the prohibitive prices charged for the electric truck.

We do not have to tell the dealer, nor the prospective buyer, that until the M & P Truck was placed upon the market, $2200 was about the lowest price for which a truck of this description could be bought.

We offer here now to your trade, Mr. Dealer, a high-grade, sturdily built, dependable electric truck with express body, as shown here, complete for $1500.

Do not presuppose that this price indicates inferiority. Remember we guarantee the M & P Truck to perform more and better service at a more moderate cost than could a gasoline truck selling for much more.

Electricity is the logical motive power for the handling of merchandise. This has been proved and over-proved.

And so it is that truck owners and prospective truck owners will welcome this announcement, because it puts a standard, dependable car within the reach of the average business concern that needs it.

The proposition we have to advance to dealers is very attractive. Primarily, of course, price is a big consideration, but when we tell you more about the quality, simplicity and grace of this truck, you will be interested.

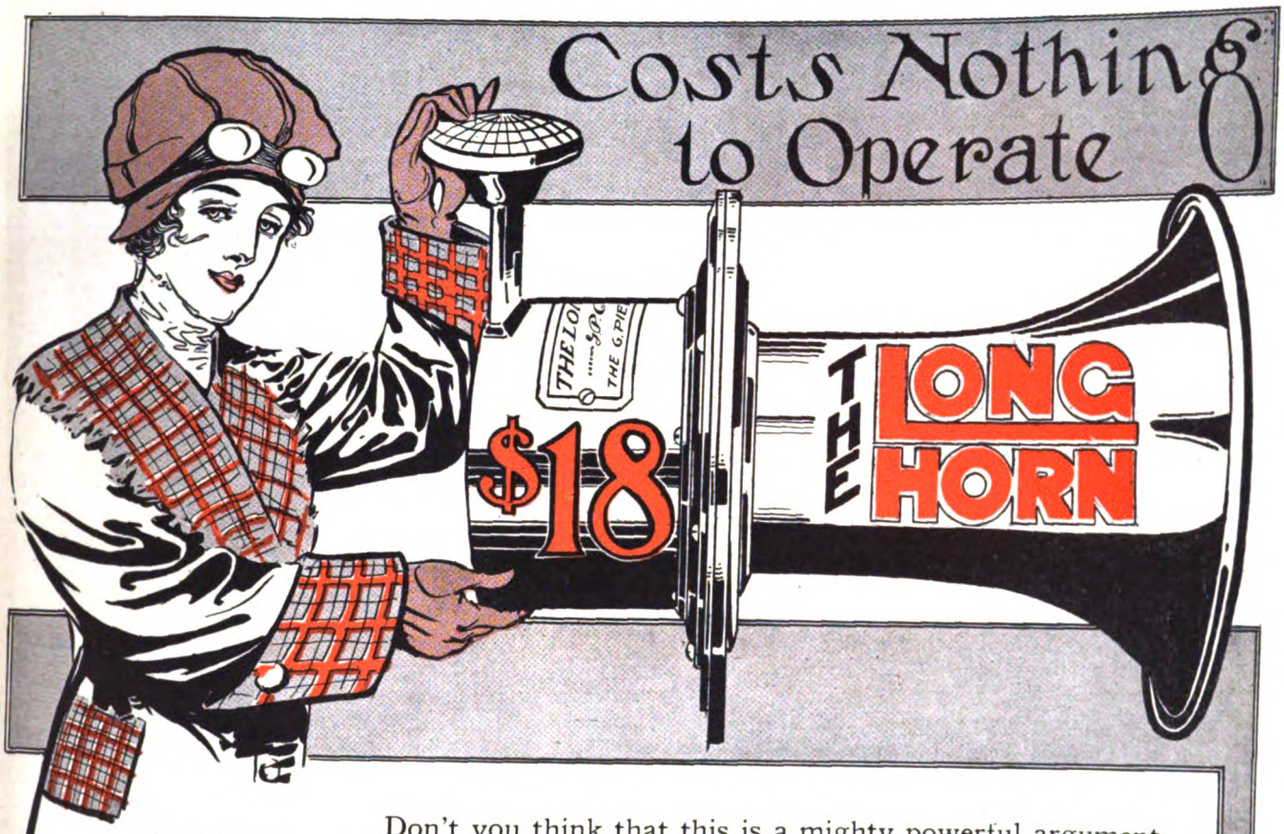
You will be still more interested in learning of the liberal commission and easy terms we make to responsible dealers. It will pay you to get this information.

THE M & P ELECTRIC VEHICLE COMPANY

Franklin and DuBois Sts. **DETROIT, MICH.**

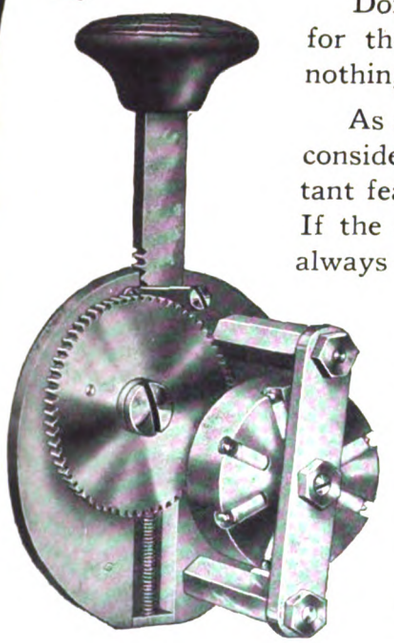
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Costs Nothing to Operate

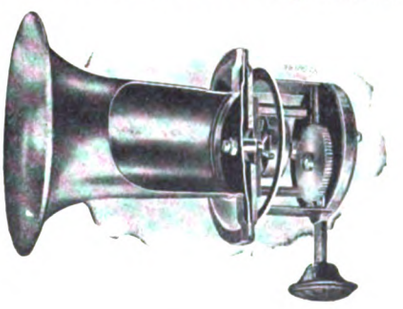


Don't you think that this is a mighty powerful argument for the sale of a warning signal—the fact that it "costs nothing to operate"?

As a matter of fact, this is the least important point to be considered in the sale of the Long Horn. The most important feature is that the Long Horn can never fail to operate. If the driver of the car can push the button the horn will always sound its warning note.



It is this fact—the never-failing feature—that makes the Long Horn stand out pre-eminent among all warning devices. The Long Horn is not an electric horn. It is the superior of any electric horn even when that electric horn is working. The Long Horn is a mechanically operated horn, free from motors, batteries, bulbs and wires. There isn't an accessory on the market that sells so well as the Long Horn. There is a big margin of profit in it for the dealers and it's a mighty fine asset to have on your shelf. Don't wait—get in touch today.



THE G. PIEL COMPANY 13th Street and Boulevard LONG ISLAND CITY

PHILADELPHIA, 1334 Vine St. BOSTON, 305 Massachusetts Ave. MINNEAPOLIS, 70 So. 10th St.
BUFFALO, 51 Main St. SAN FRANCISCO, 1 Drumm St. LOS ANGELES, 1529 So. Olive St.
SEATTLE, 317 1st Ave. So. PORTLAND, ORE. DENVER, 15th and Curtis Sts.

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Just as Warm in January as in August

TO ALL intents and purposes driving in January is just as comfortable as driving in August, provided the car you operate is equipped with a Warm Hand Wheel.

This Warm Hand Wheel, by using fresh air preheated by your motor, or by using a special electrical attachment, which takes the place of hot air, will keep your feet and hands just as warm in January as they are in August, or warmer if you desire.

It is a fact that if your hands and feet are warm your whole body is warm, so that the Warm Hand Wheel will absolutely make driving on the coldest day in winter thoroughly warm and comfortable without the use of burdensome clothing and wearing apparel.

The Warm Hand Wheel makes winter driving safe by preventing cold, benumbed hands. The Warm Hand Wheel saves doctor bills by preventing you from becoming chilly and catching cold during winter driving. The Warm Hand Wheel enables you to get more days driving out of your car than you would without using it.

DEALERS — This Accessory Means Greatly Increased Car Sales for You.

You know that if as many people drove cars in the winter time as in the summer time, that you would sell a lot more cars and that the supply and accessory business would be much more brisk.

You know also that if people could keep as warm and comfortable in winter as they do in summer there would be a lot more people driving in winter.

Then it is up to you to boost for the Warm Hand Wheel.

Why?

Because the Warm Hand Wheel makes winter driving just as comfortable as summer driving.

We are in a position to supply you or your customers with the Warm Hand Wheel—either the type using hot air or the one which operates by electricity.

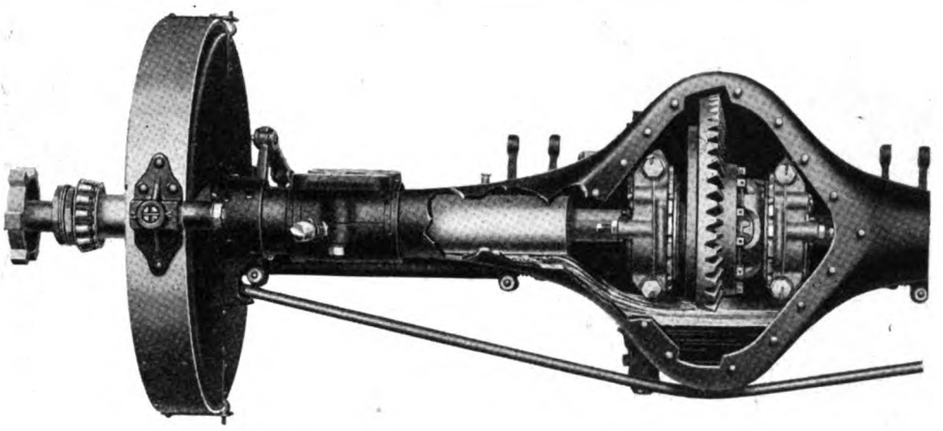
Insist that the cars you handle next year be provided with heated steering wheel—not alone because you will sell more cars, but because it will mean safety and comfort for your customers.

If your manufacturer will not supply you these steering wheels, get into communication with us and we will tell you how to get them.

Warm Hand Steering Wheel Co.
527 Fifth Avenue **NEW YORK**



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There's Danger to Life in Oil-Soaked Brake Linings

Sometimes—to avoid a crash—you have to jam on the brakes and stop your car mighty quick.

It may mean life or at least a bad smash if those brakes don't grip safe and sure. Oil-soaked brake linings are dangerous at such a time.

TIMKEN-DETROIT AXLES

have pockets to retain the oil

Time was, with all axles, when oil from the differential used to work along the live axles, leak out at hubs and get into the brake linings.

Time was, when it stained the wheels, ran down the spokes and injured the tires.

Just as it's doing today in many good axles.

But the new internal sleeve in the 1912 Timken-Detroit axle-housing has put a stop to that trouble.

All the oil now stays at the differential where it belongs.

So simple it's a wonder we didn't think of it long ago

Really effective things are almost always simple. Yet often they're found only after trying all the complex ways one can work out.

We put reinforcing sleeves in the Timken pressed steel housing to increase its ability to carry the load.

The outer ends of the sleeves support the bearings and the wheels. The sleeves go in beyond the spring-seats where the car's weigh rests. This much for strength.

Then somebody said, "Why not run the sleeves in to the central opening in the differential housing, just to make pockets that will retain the oil?" Why not?

Oil doesn't get to the brake lining—stays where it's needed, in the housing

And that's what we did. Look at the picture. The oil is thrown to one side by centrifugal force when the car rounds a curve.

The Timken pocket catches the oil and holds it—all of it—till the car goes straight and gravity returns it to the differential.

That's all there is to it. Simple as standing an egg on end—when you know how.

Yet it does the work, prevents soaked brake linings, saves oil, insures ample oil at the gears.

Its very simplicity and efficiency make it such a natural kind of development in the Timken-Detroit Axle.

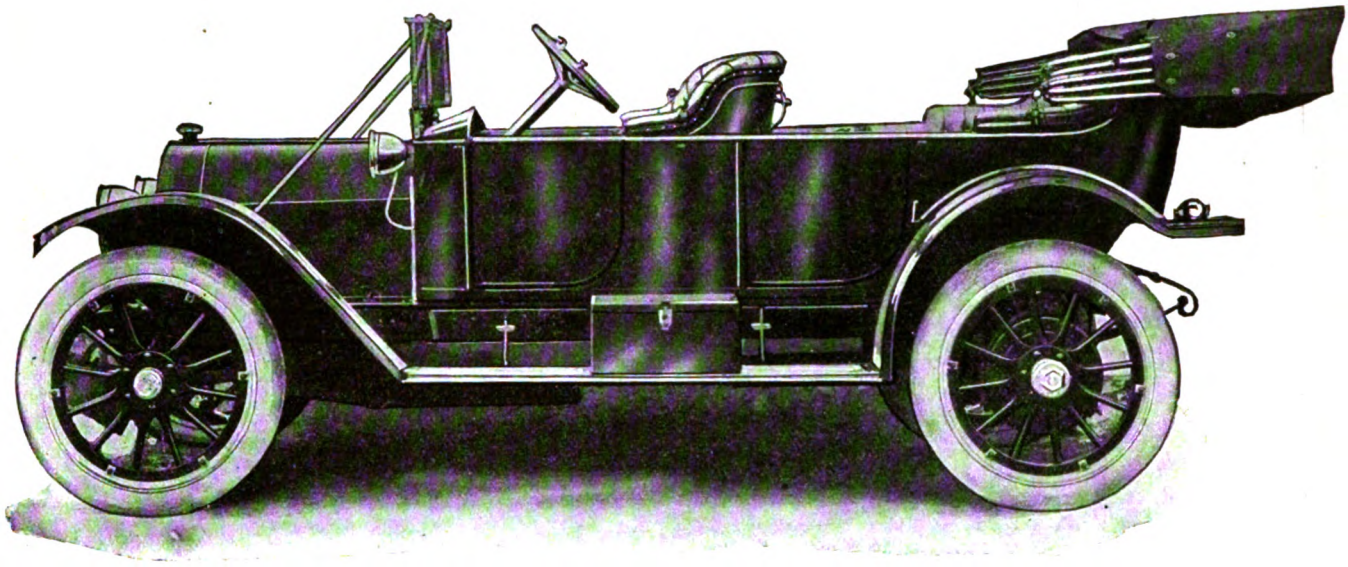
The Timken-Detroit Axle Company

Detroit, Michigan, U. S. A.

The only axle manufacturer licensed to make axles equipped with the famous Timken Roller Bearings

16

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Intelligent Distribution

Do You Go After the Prospect or Does He Come to You?
Do You Sell the Car or Does He Buy It? It's Important.

Have you ever stopped to wonder just what will happen when DEALERS will sell AUTOMOBILES along the same modern business methods as employed in the sale of cash registers, typewriters, and insurance?

Isn't it a fact that a large percentage of DEALERS actually do business on a "Brain memorandum?" How many Dealers have installed a "Possible Purchaser List," a "follow up system" or a "checking list" to keep in touch with competitors' sales?

YOU KNOW all the DEALERS in your territory, the cars they represent and the number they sell. Are any of them employing the selling methods that are even comparable to those in vogue with the sewing machine dealers?

You know the answer—they are doing business along the same lines they would have pursued if AUTOMOBILES were manufactured one hundred years ago. Just waiting for the PURCHASER to drop in and sell himself.

The Above Condition Actually Exists in Every Territory. Some Dealers Are Years Ahead of Others and Are Anxious to Modernize But

IF YOU WERE A PULLMAN DEALER

you would have the backing of the Pullman SALES MAKING ORGANIZATION. A 20th Century distribution department that SHOULD be the 51 per cent. part of any Manufacturing business.

A perfectly developed "PRODUCER" that spends thousands of dollars (our plan on request) to locate your possible purchaser, to get you in touch, to separate the "live prospects" from the "maybe's."

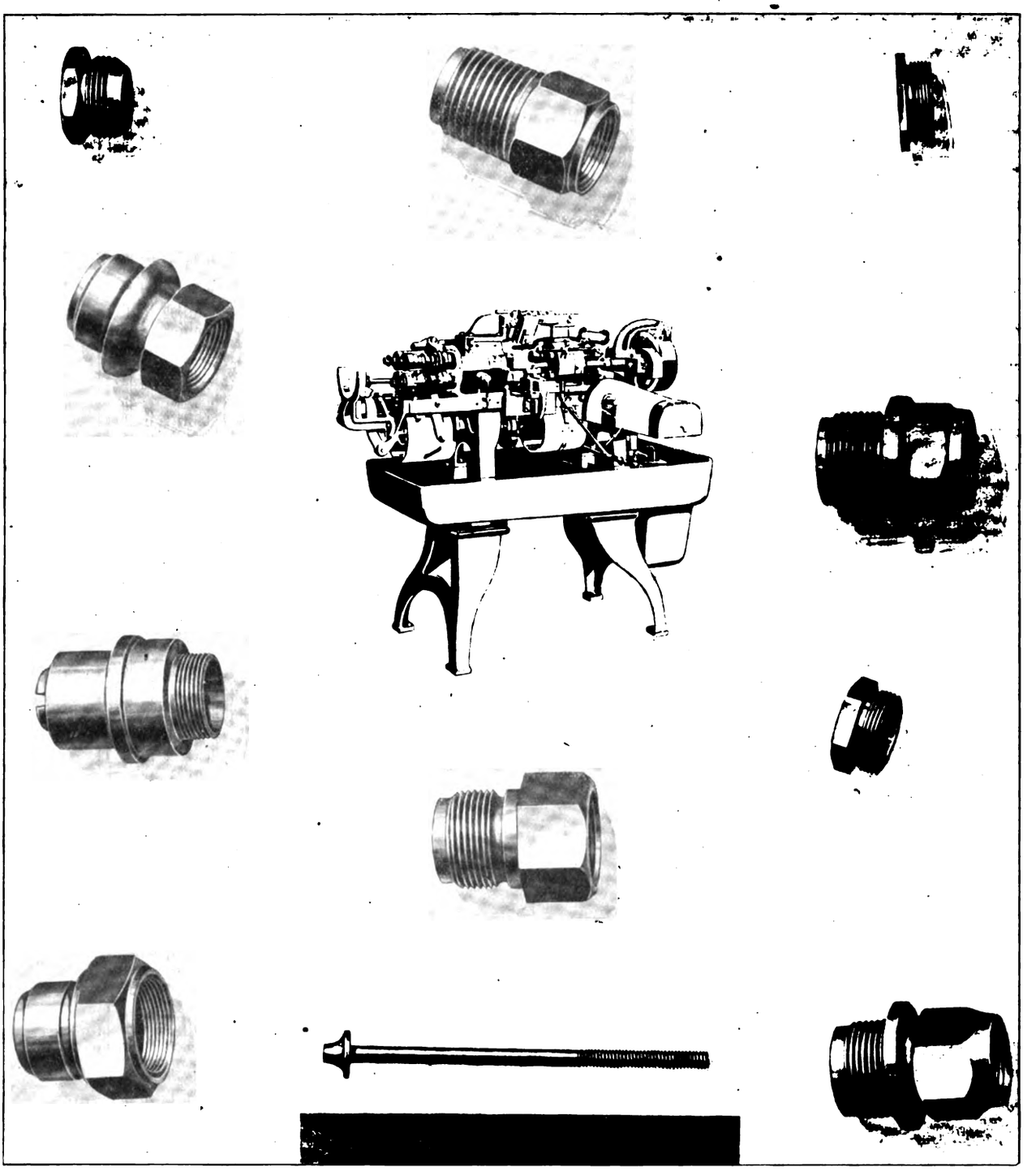
BRIEFLY—We are building 500 extra PULLMANS for 1913. Fifteen hundred in all. Our present Dealers have spoken for 1000 and the increase is for new territory—possibly yours is open.

For 1913 We Offer Three New Models—All Fully Equipped

4-36—$1675 4-44—$2150 6-66—$2750

Pullman Motor Car Co., York, Pa

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WHETHER you buy or make spark plug parts the Acme Way is the best. Because of the rapidity and economy of the method and the fine quality of the goods produced.

If you buy the parts send for the "Special" Booklet. If you make them send for the "Acme" Booklet. They describe the service and the method.

THE NATIONAL-ACME MANUFACTURING CO., Cleveland, Ohio

AUTOMATIC SCREW MACHINES AND THEIR PRODUCTS

NEW YORK CHICAGO BOSTON DETROIT ATLANTA MONTREAL

General Foreign Representatives—Alfred H. Schutte, Cologne, Paris, Brussels, Liege, Milan, Bilbao, Barcelona, Schuchardt & Schutte, Berlin, London, Vienna, Stockholm, St. Petersburg, Copenhagen, Budapest, Shanghai.

BENSON BROS., Australia

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The Michigan "40"

Wants More Dealers

This year the Michigan "40" will take its place in the very front rank among advertised cars.

It has taken four years to get ready. During that time we have gathered around us some of the ablest men in this line.

We have put out 5,000 cars, and carefully watched their performance. We have made in four years some 300 improvements.

We have equipped an up-to-date factory, with 1,200 employees, and 600,000 square feet of space. So we have an easy capacity of 150 cars weekly.

And we now have a car, at a modest price, with which the right dealer can easily outsell any other car in its class.

We now seek that right dealer in every section not closed.

Designed by Cameron

Our designer-in-chief is W. H. Cameron, for years the chief engineer of the Overland. There is not a more competent engineer in America.

Under him are experts of the highest order, in charge of every detail.

The Michigan "40"—the 1913 model—is the very last word in modern designing. Its equipment is complete and attractive, including electric lights and dynamo. Its tires are oversize—35x4½ inches. It is built with four forward-speed transmission, the most perfect ever designed. Its lines are impressive. Its finish and upholstering have never been excelled. Its price is far below any other car in its class.

We can't publish the details until our big announcements are made, but we will go into complete details with every dealer, and better yet, show him the car.

Bodies by Campbell

The bodies for this new model are designed by John A. Campbell, famous in this line the world over.

Mr. Campbell is one of the few recognized masters in the designing of vehicle bodies. The finest equipages of the late King of England were of his designing. So with the Sultan of Turkey.

Many of the most distinguished families in Europe and America have long given preference to Mr. Campbell's designs.

Mr. Campbell is now in our exclusive employ.

All of his exquisite skill has been brought to bear on the Michigan "40." You never have seen a car which surpassed it in simple elegance, distinction and grace.

Advertised by Hopkins

Our advertising appropriation for the coming season is $350,000. This will place the Michigan among the three biggest advertised cars in America.

This advertising will be handled by Lord & Thomas, who have handled nearly all of the greatest successes made in advertising automobiles.

George H. Daugherty, formerly head of the copy department of Lord & Thomas, will direct this campaign from our office.

C. C. Hopkins, Vice-President of Lord & Thomas, will personally write the copy. Mr. Hopkins is the highest-paid man in this field. And his remarkable campaigns on automobiles include five of the greatest successes ever made in this line.

Our Organization

The Michigan "40" has behind it a very rare organization. Its owners have spent over 30 years in successful vehicle building. Our reputation in this line is nation-wide.

The Michigan Motor Car Company is a separate organization, but it is backed by all of the capital and all the experience of the 30-year-old concern.

The Michigan "40" is four years old. It is the product of some of the best brains in this industry. No concern in the line ever took greater pains to gather able men around it. The names we have mentioned indicate that.

Dealers are thus assured that every detail of this business will be handled capably.

The Record to Date

We have sent out in test territories 5,000 Michigan cars, to be sure of our ground before we undertook this expansion.

Last year in these test territories the Michigan probably outsold every car in its class.

550 were sold in the Pittsburgh district alone. Our home city took 70. Portland, Ore., took 162.

On that same basis, the country over, the Michigan would have been the dominant medium-priced car.

The new model Michigan is immensely better. We are bringing out this season some seventy improvements. This, with our present capacity, organization and advertising, puts the Michigan in the front rank at once.

A Great Opportunity

This means for one dealer in every locality a very rare opportunity.

It means a car which, on simple comparison, will easily outsell any other car in its class.

It means a coming car, backed by money and ability—by efficiency and experience—by a 30-year record for making good.

It means an advertised car, where nine-tenths of the selling is done for the dealer, and done with the highest ability.

It means a car which every possible prospect is bound to come and see. And the price—under $1,600 with complete equipment—will make competition difficult indeed.

Our advertising begins September 1, with double-page spreads in all leading mediums. By that time we want nation-wide distribution. So immediate action is necessary.

We invite immediate- correspondence from capable dealers. Or better still, come to our factory at once. Write or wire for an appointment.

The Michigan agency has a money value. And it is the only great agency that isn't sewed up in nearly every center.

If these facts appeal to you, act—now.

Michigan Motor Car Company, 259 Lay Blvd., Kalamazoo, Mich.

Owned by the owners of the Michigan Buggy Company

(99)

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1/4 MILLION

EXHAUST TUBES IN TWELVE MONTHS

We made this enormous quantity because we received orders for them. We received orders for them because we can make them better, cheaper and quicker than any one else.

We make them better because we have the most up-to-date machinery and employ only expert workmen.

We make them cheaper because we make our own tubing and make so many.

We make them quicker because we know how to make them and do not fuss, fret or fume if the job is new or a "sticker."

Our tubes are strong, accurate to dimensions and very light in weight.

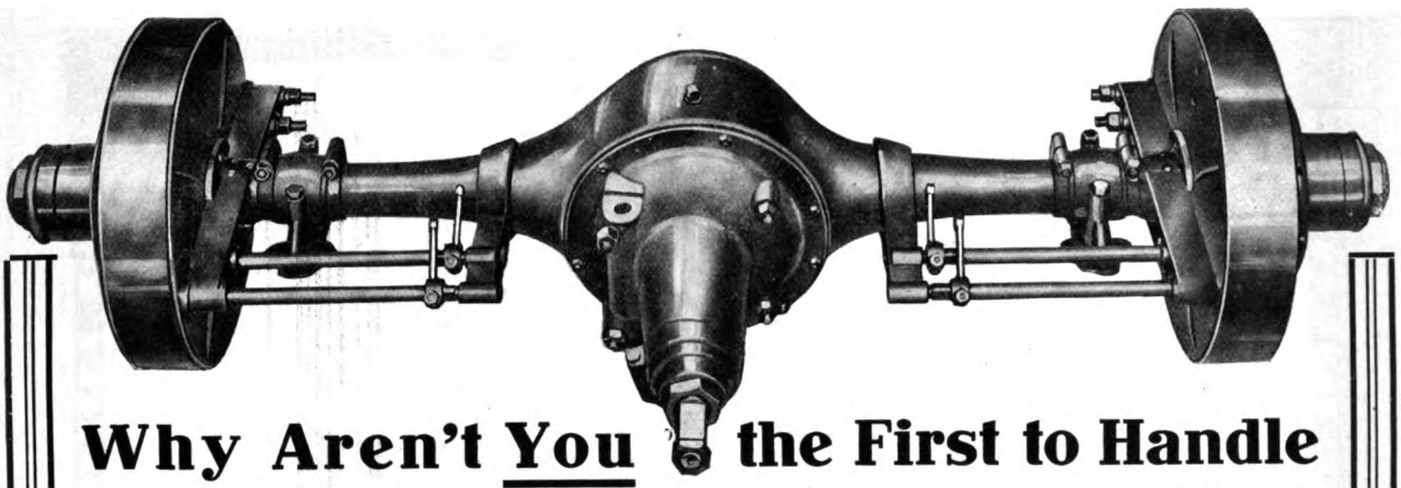
It is not foolish to make your own tubes, but it's futile, especially when you can get what you want without wandering.

THE STANDARD WELDING CO.

CLEVELAND, OHIO

NEW YORK CHICAGO DETROIT

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Why Aren't You the First to Handle Wire Wheel Equipped Cars in Your City?

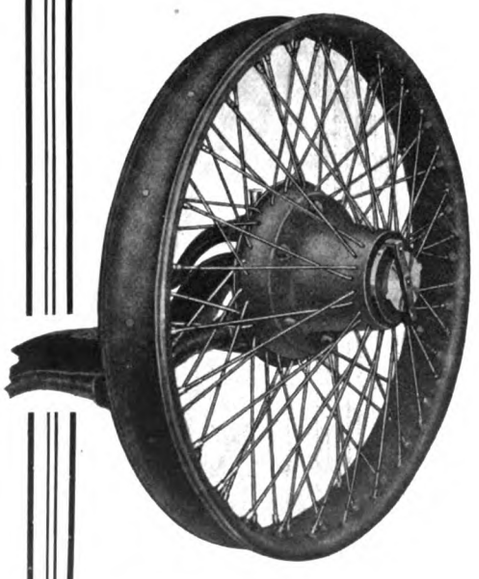
Wouldn't you rather be the leader with all the other dealers following you than to hold off now and later on admit that the other fellow was ahead of you?

Wire wheels have come. Don't make any mistake about that. They are here to stay just the same as they are abroad, where the vast majority of real cars are wire wheel equipped.

Just as it has always been, so it will always be, with wire wheels as with every other development; a few of the "progressives" will "set the pace" and "the rest of the gang will follow."

You must realize that any accessory or improvement which means practically 70 per cent more tire wear is a God-send to you because it is bound to stimulate the sale of cars.

This Is Where the Dealer Plays the Important Part



You are the boy that feeds the manufacturer.

It is your customers' money that he is spending.

If you insist upon his putting wire wheels on the cars you sell, wire wheels will be put on those cars. It's up to you to be a "progressive" dealer and see that your customers' money is well spent.

Don't weaken! You can have wire wheels if you have the backbone to fight for them. If you can get them and get them first you are going to clean up in your territory just as sure as fate. If you don't think you can do this yourself, write us and tell us you want wire wheels on the cars you handle and we will go to the mat for you good and strong.

Remember this, that McCue axles and McCue wire wheels are synonymous with the greatest advancement in the automobile industry.

McCue axles are so built as to permit of either wire wheels or wooden wheels on the same spindle. This simplifies the manufacturing problem greatly.

THE McCUE COMPANY
Buffalo, New York

70% MORE TIRE MILES
WIRE McCUE WHEELS

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"The Horn that's Made for the Discriminating"

TUTO HORN

THE TWO TONE HORN

Sound Projects Ahead.

THE primary purpose of the warning signal on a motor car is to notify others of its approach.

¶ All of the sounds that are projected to the side and rear of the car are not only wasted energy, but offensive to everybody for which they are not intended.

¶ The TUTO Electric Horn is so designed and constructed that practically all of the sound is projected straight ahead, where it will do the most good, consequently, giving the very highest operating efficiency that it is possible to produce in a warning signal device.

¶ This projecting action of the TUTO horn is so effective that very little of the sound can be heard by the occupants of the car. To the uninitiated, this may be misleading, especially when comparison is made with other types of horns which are so constructed and mounted as to make as much noise in the ears of the car occupants and those at the side and rear of the car, as for the people ahead where practically all of the sound should be projected.

¶ This straight ahead, efficient action of the TUTO Horn makes it most desirable for standard equipment on any motor car, as it does its work with the least possible disturbance to car occupants and others not concerned in the sounding of the signal. It is this important advantage, together with the double service feature of the TUTO Horn—a low note for regular service purposes and a loud note for emergencies—which makes it the best warning signal device for standard equipment.

¶ Discriminating users now demand the TUTO Horn in preference to all others. You can get it on your new car by simply specifying that it shall be TUTO equipped.

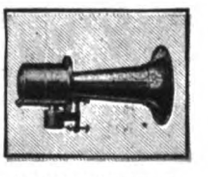


TUTO Horn, $25.00

The Dean Electric Co.

260 Taylor Avenue, Elyria, Ohio

"Look for Dean where Quality's seen"

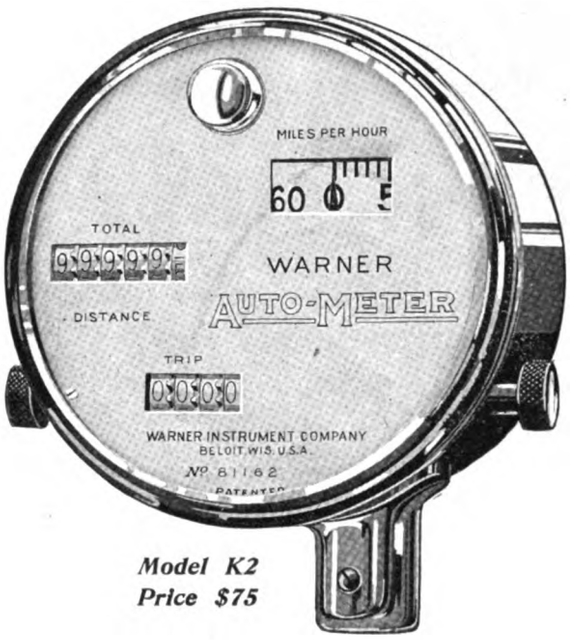


TUTO-ETTE $17.50

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Model K2
Price $75

Warner AUTO-METER

THE WARNER AUTO-METER is to the automobile world what U. S. Government clocks are to the nation.

Practically every prominent automobile manufacturer has contracted for the Warner Auto-Meter for his 1913 equipment. We have signed contracts for the equipping of more than 100,000 new cars.

This official recognition of the Warner Auto-Meter comes after eight years ruthless competition with cheaper instruments. The Warner Auto-Meter is chosen despite its highest price.

The Warner Auto-Meter will replace some other instrument on more than 100,000 new cars. The other instruments must be inferior. The verdict of the representative makers is final.

Priced from $50 to $145. For sale at our own branches and leading dealers the world over.

Handsome catalogue on request.

The Warner Instrument Company

Beloit, Wisconsin

Atlanta	Denver	Philadelphia	Boston	Detroit	Pittsburgh
Buffalo	Indianapolis	Portland, Ore.	Chicago	Kansas City	San Francisco
Cincinnati	Los Angeles	Seattle	Cleveland	New York	St. Louis

Canadian Branch: 559 Yonge St., Toronto, Ont.

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LBA

LIGHTING BATTERIES

Have capacity without bulk.
Have capacity without weight.
Have unit system of cells.
Have all cells independent from each other.
Have independent sets of connectors.
Have no leakage between cells.
Have every connector insulated from the cover and from one another.

This is why the leading automobile manufacturers have adopted the LBA as standard equipment for electric lighting on their 1913 models.

USE THE CLASS A LBA BATTERY WITH AN ELECTRIC LIGHTING GENERATOR

USE THE CLASS B LBA BATTERY WITH AN ELECTRIC SELF STARTER

Write us for full information

WILLARD STORAGE BATTERY CO.

CLEVELAND, OHIO

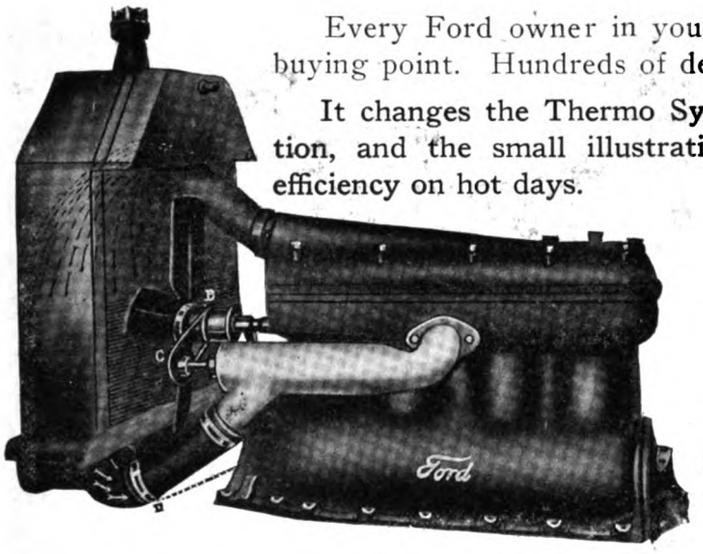
New York Branch, 136 W. 52d Street **Chicago Branch, 436 S. Dearborn Street**
Detroit Branch, 1191 Woodward Avenue

Depots in all principal cities in the United States, Canada and Mexico

BATTERIES

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Ford Dealers Read This Then Act!



Every Ford owner in your territory will be interested clear to the buying point. Hundreds of dealers will back this statement.

It changes the Thermo Syphon System to force circulation, and the small illustration tells the story of engine efficiency on hot days.

The Ford Water Circulator

forces the water through the cylinder water jacket by the positive drive of the worm screw, insuring rapid circulation with mechanical pressure back of it, giving

A Cool Motor Always

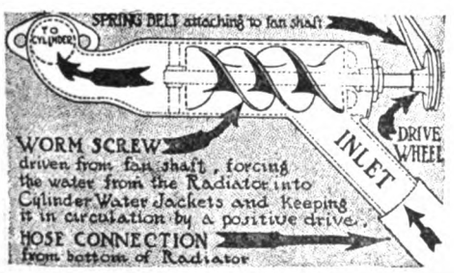
The Ford water circulator can be installed in twenty minutes without boring or reaming. The worm screw shaft is driven off a split pulley on the fan shaft, through a spring belt that snaps on in an instant.

Always in motion when engine is running—practically no excess power required to drive—does not impede circulation when motor is at rest.

"Furnish Ford Owners With This Cooling System"

It saves engine wear and tear, promotes speed—saves repairs—economizes on oil—prevents carbon—comes to you ready to install—weighs but three pounds—cast aluminum.

Price $12.50 **Our Proposition Through the Jobber Will Interest Live Wire Dealers.**



THE FULTON-McCUTCHAN CO.
1146 Michigan Ave.
CHICAGO, ILLINOIS

Ford Owners
30 Days Only

Here is a $2.50 Coupon for You

Mr. Dealer and Mr. Jobber:

This coupon entitles the signer to a rebate of $2.50 on the purchase price of a Ford Water Circulator. We stand behind it.

THE FULTON McCUTCHAN COMPANY,
1146 Michigan Avenue, Chicago, Ill.

Name .....

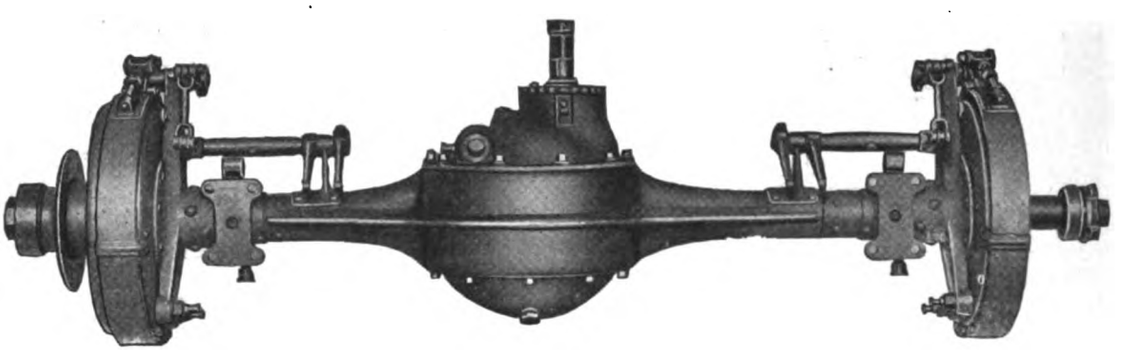
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American American

American Axles

Poor Axles Will Rob Your Electric's Batteries



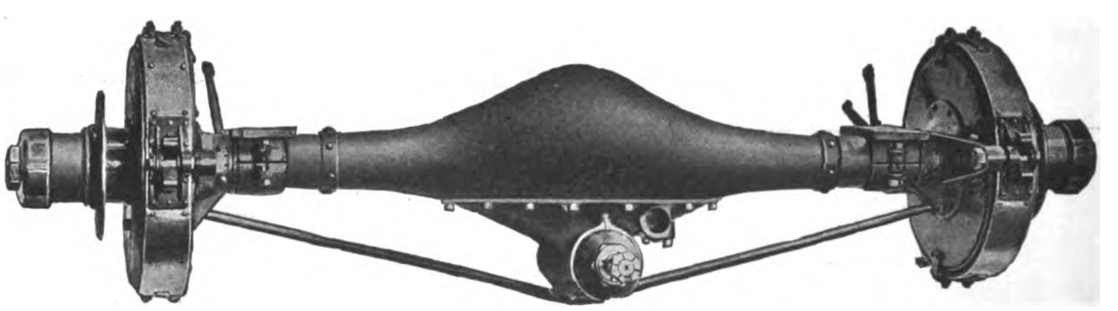
Do you know that the amount of service your battery gives is based squarely upon the quality of your axles?

Do you know that the more current used to overcome mechanical difficulties, the less remains for motive power?

Do you know that *American Axles* with their patented features ensuring easy running, are of tremendous importance in securing maximum mileage?

We designed and manufactured the first successful Bevel Drive axle suitable for use in electric vehicles, giving it the refinement demanded for this exacting service.

We also build the famous Lanchester-Daimler Worm Gear axle, holding the exclusive American rights as axle manufacturers through the Warner Gear Company, of Muncie, Ind.



THE AMERICAN BALL-BEARING CO.

Edgewater Park and L. S. & M. S. Ry. CLEVELAND, OHIO

American

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In the Otho System

THE FINAL SOLUTION OF

Self Starting
Lighting
Ignition
Signalling

"Is right" Inside the Flywheel

The finality of simplicity—the last word in modern electrical engineering as applied to automobiles—the only self starter that turns the engine 75 R. P. M. right from the start, spinning it indefinitely.

Power plant stores current as needed—enough for the starter, for lights, ignition and, if necessary, for heating.

Built right in the fly wheel(which, by the way, is the only moving part of the appliance), simple, strong, never out of order, always ready.

No complicated or moving wiring, no gears, clutches, shafts, chains, or, in fact, any other complication.

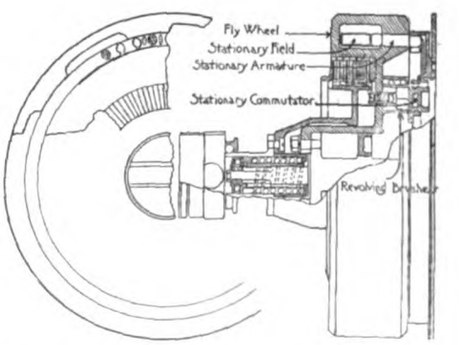
The Otho system generates its own power—then uses it, in a mechanically and electrically perfect way, it being directly attached to crank case, acting on the fly wheel, and not connected by belts or gears.

This is our introduction to a story that is going to be of out-of-ordinary interest to every manufacturer who sees the keen need for a device that will furnish a powerful, natural starter with a reserve supply of current ample to meet every requirement in the way of lighting, ignition, and signaling.

Succeeding advertising, with detail illustration, will go further into a description of the Otho system.

We want to go into this matter with car manufacturers, because we kno wthat this system will prove to be the most radical and improved refinement ever put upon an automobile.

Engineers, designers and purchasing agents will do well to communicate with us, sending as a preliminary measure, blue prints covering engine construction.



THE OTHO MOTOR COMPANY, 60 State Street, Boston, Mass.

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REGRETS are very unsatisfactory affairs. In this connection we wish to remind you—

¶ Wait for the 1913 OVERLAND ANNOUNCEMENT. It will be made on August 17th. It will send a thrill through the entire country. We want you to be in on it.

¶ WAIT—You can be one of the record breakers. We will make you a startling bid. You can set a new sales record in your district.

The Willys-Overland Company, Toledo, Ohio

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THE MOTOR WORLD

Vol. XXXII New York, U. S. A., Thursday, August 1, 1912. No. 6

MAY SETTLE DYER PATENT SUITS

Negotiations Pending Between Patentee and Board of Trade—Latter May Obtain Licenses for All its Members.

Unless a hitch develops, it is probable that, save for certain legal formalities, the last has been heard of the suits brought by Leonard H. Dyer, who comprises the Enterprize Automobile Co., of New York, against the Locomobile Co. of America, Winton Motor Carriage Co. and Maxwell-Briscoe, Inc., and which charge infringement of the Dyer patents, Nos. 885,986 and 921,963, which cover the direct drive and sliding gear now in general use. For, while all of those concerned are close-mouthed, it is known that negotiations are in progress looking toward not only a peaceful settlement of the litigation but toward the issuance of licenses which will safeguard from similar proceedings all other members of the Automobile Board of Trade.

How far the negotiations have progressed, however, cannot be ascertained, but indications make it appear that both sides are favorably disposed. The patent experts of the Board of Trade have realized that the Dyer patents are of far-reaching character, while the Dyer interests are not insensible of the fact that recognition of their rights by such an important and influential organization greatly will strengthen their position and enable them to proceed with vigor against the many manufacturers who will not be affected by the pending settlement.

The suits against the Locomobile, Winton and Maxwell-Briscoe companies have been pending in the Federal court in New York for some 20 months, but repeated extensions have served to delay the taking of testimony and, to all practical purposes, the litigation has not made material progress. Who or what were responsible for the negotiations looking towards a peaceful settlement is a matter of conjecture.

As the Motor World has stated on several previous occasions, the predecessor of the Board of Trade, the Association of Licensed Automobile Manufacturers, in 1905, purchased five Dyer patents which have to do with various functions of the transmission system. It supposed that thereby it had fully protected its members from litigation involving any of Dyer's patents, but in 1910 Dyer, operating as the Enterprize Automobile Co., brought to bear the two patents which now loom so large as to be almost a controlling influence in the industry, Nos. 885,986 and 921,963, which in 1905 had not been issued, although they were pending in the patent office. The intimation has been let fall that when the Dyer interests were negotiating the transaction in 1905 with the A. L. A. M., realizing their controlling character, they "held out" the two unissued patents, and it was understood that this allegation would form a part of the defense in the Locomobile, Winton and Maxwell-Briscoe suits. A peaceful settlement, such as now is promised, will render unnecessary the washing of that piece of linen. But it will not serve to protect other than the members of the Board of Trade, nor will it affect the many suits which Dyer has brought against individual owners.

Knapp Assumes Abbott Presidency.

F. M. Knapp, of Warren, Pa., has been elected president of the Abbott Motor Co., of Detroit, to fill the vacancy caused by the death of C. W. Jamieson. M. M. Preston, also of Warren, who was second vice-president of the company, has been made vice-president, which office previously was filled by Knapp. F. B. Jamieson, of Warren, manager of the Jamieson estate, has been elected a member of the board of directors. As the new president conducted the affairs of the Abbott company during the long illness of Mr. Jamieson, he, therefore, is in no wise strange to his duties.

More Tires Coming from Providence.

The Bourne Rubber Co., of Providence, R. I., is making ready to engage in the manufacture of automobile tires. Heretofore it has devoted itself to the production of rubber sundries.

NEW MEN ENTER LOZIER COMPANY

Jewett Takes the Presidency and New Yorker Becomes Treasurer—Lower-Priced "Six" to be Featured.

After a long period of that unhappiness which comes of operating a large corporation with stinted working capital, the Lozier Motor Co., of Detroit, finally has reached the turn in the lane which points the other way. The change of affairs was brought about late last week, when Harry M. Jewett, one of the most successful coal operators in the West and the head of the Paige-Detroit Motor Car Co., succeeded Harry A. Lozier as president of the company; he, however, retains his office in the Paige-Detroit company. At the same time, Raymond B. Fosdick, of New York, was elected vice-president and treasurer and E. P. Earle and H. E. Kahler, also of New York, were added to the Lozier board of directors, the new men bringing with them new money, which, with their undoubted ability, scarcely can fail to exert immediate influence.

President Jewett has worked wonders in the Paige-Detroit company in about 18 months, having brought it to a stage of unwonted prosperity, while Fosdick, the new treasurer, although strange to the automobile business, is a deep delver and thorough reorganizer, whose ability in those respects has been amply demonstrated in New York City, where he has served as the Mayor's commissioner of accounts, or official prober. Harry A. Lozier, the former head of the Lozier company, will remain a director of the company, but will be relieved of the burden of business cares which has brought about a nervous condition and left him in poor health generally.

When, about two years ago, the Lozier company removed from New York to Detroit, it acquired a large accession of Detroit capital, which at the time was badly needed. The renewed affluence was of only a temporary character, however, and during recent months rumor has been free

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with Lozier affairs. Two months since reports had it that Henry Ford had purchased, or was about to purchase, the Lozier plant, which, so far as ascertainable, was based on a statement that the Lozier property had been offered to Ford, who, however, purchased no part of it. Soon afterward the Lozier company liquidated many of its old debts, which fact made appear that new money had been forthcoming from some sources, which sources, according to apparently trustworthy accounts, were two immensely wealthy directors of the Lozier company, who provided $500,000 in consideration of Lozier's turning back into the treasury one-half of the stock which he held, which action placed them in control.

That the affairs of the company were approaching a climax was indicated on Saturday last, when an attachment against it was filed in New York by the Merchants' National Bank of New York on a note for $25,000, due July 25th, of which but $2,919.70 had been paid. Reflecting the reorganization which had been effected in Detroit, on the same day the attachment was vacated and the action discontinued.

Heretofore the Lozier company has concentrated its effort on a 50-horsepower, six-cylinder model listing at $5,000, although it was known that a "little six" was in preparation. The latter now is well in hand and the most will be made of it by the new management. It will be styled "Type 77, Light 6," and is referred to not only as a "self-starter" but a "self-seller." Its cylinders are 3⅝ x 5½ inches, developing 36 horsepower. In addition to an engine starter, its equipment includes the Gray & Davis dynamo lighting system, a speedometer, clock, electric horn, top, windshield, extra demountable rim, tire holders, etc. It will list at $3,250, and in lines and appearance closely follows the Lozier "big six."

Wishart-Dayton Thrown into Bankruptcy.

Although the Wishart-Dayton Auto Truck Co., of 501 Fifth avenue, New York City, was supposed to be financially sound, if for no other reason than that it was sponsored by George Wishart, father of Spencer Wishart, the Mercedes racing driver, a receiver was appointed for it yesterday in Federal Court in New York City upon the petition of William Farnum, Eugene C. Ludin and James H. Rooney, whose claims for services aggregate $961.02. They allege that the concern has been insolvent for some time and has made preferential payments and other similar moves. Including a claim of $7,000 by the Dayton Auto Truck Co., of Dayton, O., the liabilities are said to be $9,000 or $10,000, while the principal assets are one Dayton and one Ohio truck, together valued at $5,000. The petitioners, however, allege that the furnishings of the office, together with the trucks, have been moved and secreted, and the creditors ask the court to unearth the assets that their claims may not be rendered worthless.

DISCO TO MAKE ELECTRIC STARTER

Detroit Company Makes an Unexpected Move—Gas Starters, However, Will Remain its Chief Production.

Indicative of its intention to meet all demands and to maintain its position in the trade, the Ignition Starter Co., of Detroit, has completed arrangements for the manufacture of an electric lighting, starting and ignition system, which decision undoubtedly will serve to create widespread surprise, as it was supposed the company was wedded to the gas starter.

The electric system will bear the title Disco, but its manufacture does not portend that the Ignition Starter Co. will devote less attention to the well-known Disco gas starter. It means chiefly that the Disco people have elected to so position themselves as to respond to all calls. They already have placed orders for necessary machinery and equipment, and are negotiating for a factory building in Detroit which will afford 100,000 square feet of floor space. In addition to the gas starter, they are planning to build 12,000 of the electric devices for the season of 1912-13, the delivery of which will begin about September 1st.

"In adding the electric system to our line," said George P. Sweet, general manager of the Ignition Starter Co., in speaking of the matter, "we wish it distinctly understood that we are by no means abandoning or sidetracking the Disco gas ignition starter, which we will continue marketing in larger quantities than before. Our contracts for 1912-13 on the Disco gas starter greatly exceed in volume our 1912 business, but there is a demand for an electric starter and lighter of a very high grade, and we have been working for months in the development of our device. It probably will be the highest priced electric starting, lighting and ignition system on the market. Our plans are so thoroughly perfected that we will back the Disco electric system with the broadest service guarantee that the trade ever has known."

Petition Halts Kayton Amalgamation.

The Kayton Taxicab and Garage Co., of 174 East 73rd street, New York, has been petitioned into bankruptcy by the American Taximeter Co., whose claim amounts to $1,866. It is alleged that the company is insolvent and has made preferential payments to the amount of $500 and transferred merchandise and accounts of the same value. Its liabilities are $30,304 and its assets, which include 63 cabs, $13,488. The company was incorporated in February, 1908, with $100,000 capital stock, which, during the following year, was increased to $200,000. About a year since the Kayton company distinguished itself by instituting a reduced fare service during certain hours of the day, which, however, proved a failure. Negotiations looking towards its amalgamation with another company have been in progress, and the petition in bankruptcy therefore places a value on its goodwill and asks that the court take cognizance of the situation in order that the merger may be consummated, if possible.

Toledo Tire Chain Makers Reorganize.

The Walker Chain Mat Co., of Toledo, O., has been reorganized under the style Walker Tire Chain Co., capitalized at $150,000. The officers are as follows: H. F. Rohrman, president; Hugh Williams, vice-president; Maurice A. Carter, treasurer, and Charles A. Newman, secretary. Among the stockholders, it is stated, are John A. Dix, governor of New York, and William Huppuch, chairman of the New York Public Service Commission. As its name implies, the company will manufacture a non-skid tire chain grip. Its offices are located in the Ohio building in Toledo, an assembling plant being maintained in the Factories' building at 12th and Woodruff streets, in that city.

Buffalo Electric to Have Two Plants.

The Buffalo Electric Vehicle Co., which recently absorbed the Babcock electric, among other properties, has acquired the entire building at the corner of Main and Barker streets, Buffalo, N. Y., previously occupied by the Denniston Co., whose financial embarrassment, it was stated, indirectly was due to the merger. The Denniston Co. used the building for the construction of automobile bodies, but the Electric vehicle company will utilize the upper floors for the making of pleasure cars and the main floor as a salesroom. The Babcock plant on West Utica street will be devoted to the manufacture of commercial cars and an electrically-driven baggage truck.

Walpole Acquires a Second Factory.

Its plant at Walpole, Mass., having proved inadequate to meet the demand for its tires and other rubber goods, the Walpole Rubber Co. has acquired a factory at Foxboro, five miles distant, previously occupied by the Van Choate Electric Co., in which the manufacture of Walpole tires will be concentrated. The Foxboro plant comprises a group of buildings having more than three acres of floor space, and is being equipped to produce 500 tires per day; its ultimate capacity will be twice that amount.

Kelly-Springfield Sues Out Attachment.

Because of a 30-day note which went to protest, the Kelly-Springfield Tire Co., on Friday last, 26th ult., sued out a writ of attachment against the United States Motor Co. for $2,512.50, which represents a balance unpaid. The action is akin to several others which have been filed against the big corporation, which is undergoing reorganization, and did not serve to affect it in any way; it will be taken care of in due course.

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PALMER & SINGER TO FIGHT DECREE

Their Default in Dyer Suit Proves Surprise to Them—Fine Points of Legal Procedure Now an Issue.

Despite the records of the United States District Court for the Southern District of New York, which show that a decree pro confesso has been ordered against the Palmer & Singer Mfg. Co., of New York, in the action brought by the Enterprize Automobile Co. for infringement of the Dyer patents, Nos. 885,986 and 921,963, Palmer & Singer have no intention of abandoning the fight. They first learned of their default only when the Motor World, which exclusively contained the information, reached them last week, when they immediately took action to intervene and to prevent the issuance of an injunction; they state that they have every intention of fighting the case to a finish.

For the time being, however, the matter has resolved itself into a more or less personal controversy between the lawyers representing the opposing interests over certain points of legal procedure. Whether the Palmer & Singer attorney at the present has the right to demur to the bill of complaint is one of the contested points. He secured several extensions of time for answer, and on the last day of the last extension filed a demurrer, instead of an answer; the Enterprize attorney, however, chose to regard this demurrer as a nullity, holding that such a document could not be filed because no extension of time had been granted for the purpose, and, failing to find the answer on record, he moved for and secured the decree pro confesso. The defense claims the demurrer may be filed at any time prior to the entry of the decree pro confesso, and also maintains that the demurrer raises a question as to the validity of the Dyer patents, which question will have to be adjudicated. There is also the contention that the order signed by Judge Hand was made without notice to the defense and in "disregard of a demurrer properly filed in court."

The thirty days from the granting of the decree expire about August 16, and the Enterprize company then must give notice to the Palmer & Singer company that it will move for an interlocutory decree, which would entitle the complainant to damages, but the defense states it will oppose every step and considers the case as being very far from finished.

Lamp Company Brings Infringement Suit.

Alleging that the Knickerbocker Brass Goods Co., of New York City, has infringed one of its patents on a vehicle lamp, the Victor Lamp Co., of Cincinnati, O., brought suit on Monday last, 29th inst., in United States District Court for the Southern District of New York asking an injunction and damages. The complainant states it believes the damages will amount to $10,000 and names that amount in its pleadings. The patent in question, No. 980,493, was issued to William J. Corcoran, of Cincinnati, January 3, 1911, and was assigned to the lamp company. It covers a catch whereby the oil receptacle in a kerosene lamp is attached to the lamp proper. At the Knickerbocker offices it was said that lamps of this description had been made by the company and sold to the automobile trade, but that as soon as it was learned that the device was patented the manufacture was discontinued.

Rutenber to Continue Both Plants.

Reports to the contrary notwithstanding, the $1,350,000 Rutenber Motor Co., which recently took over the Western Motor Co., of Marion and Logansport, Ind., will continue to operate both plants. The foundry and the aluminum and brass works will remain at Logansport, and the manufacture of the other parts which go to make up the Rutenber engine will be performed at Marion, as at present. New machinery will be added and outputs of both plants considerably enlarged. As the Motor World stated last week, George W. Bowen, of the Bowen Mfg. Co., of Utica, N. Y., has assumed the presidency of the Rutenber company, in which he has acquired a large interest. J. W. Stepenson is treasurer and A. C. Barley is secretary of the new corporation.

Two Final Decrees Are Awarded to Weed.

Suits brought in United States District Court for the Southern District of New York by the Weed Chain Tire Grip Co. against the Newhall Chain Fore & Iron Co. of New York City and the Seneca Chain Co. of Mansfield and Kent, O., for infringement of the Parsons patent, No. 723,299, were ended yesterday, when final decrees were awarded the Weed company by consent of both parties. The actions were commenced about two years ago and were contested by the defendants until the matter reached the settlement stage. The Newhall company, before it was made the object of a preliminary injunction, made the Everready and Presto grips, while the Seneca company manufactured cross chains for manufacturers and the general trade.

Vincent now Packard's Chief Engineer.

J. G. Vincent, formerly of the engineering staff of the Hudson Motor Car Co., of Detroit, has been appointed chief engineer of the Packard Motor Car Co., of that city, and already has assumed the duties. With S. D. Waldon, vice-president of the company, he is about to set out for a long trip in the Packard "little six," which practically is ready for the market. The new model is slightly smaller and lighter than the present Packard "six," which lists at $4,850, and will sell for $4,150, completely equipped. It is expected that deliveries will commence about November 1st.

SALE OF ATLAS PLANT POSPONED

Delay Granted on Plea of Prospective Bidder—Flanders Interests also Seek Property—Knight License Involved.

Because a prospective purchaser who looks promising had not inspected the property or examined the appraisement, and therefore was not quite ready to submit a formal bid, the sale of the plant of bankrupt Atlas Engine Co., of Indianapolis, Ind., did not occur on July 29, the date fixed by the court. Instead, it was postponed until August 12, although the intending purchaser is not certain he will be in position to comply with the terms even on that date.

He is M. L. Thomsen of Cleveland, Ohio, professedly representing the Baldwin Locomotive Works of Philadelphia, which is an Atlas creditor, but who is supposed to represent others whose identity is well concealed, as is their purpose in seeking to acquire the plant.

Whoever they may be, it is their purpose to organize a company, and, according to Thomsen, they are well able to purchase the plant and finance the undertaking.

He submitted a sworn statement, in which he avers that the bidder he represents will pay $25,000 more than the upset price, $80,000, named in the court's order of sale, and assume the principal of $1,050,000 worth of outstanding bonds, besides paying off several other mortgages.

Unless the Thomsen people submit a bid, it is probable that the Atlas property will pass into the hands of the Flanders interests in Detroit. Not the Flanders Mfg. Co., of which he is president, nor the Everitt Motor Car Co., in which circumstances require him to appear a more or less silent partner, so to speak, have tendered a bid for the plant, but an offer has been made by W. E. Flanders and B. F. Everitt, of Detroit, who say they desire to use the Atlas plant for the manufacture of automobiles, which, it is well understood, will be Everitt cars, as in order to carry out their plans and to attain the output of 16,000 Everitts, which they have in view, it is absolutely necessary that a plant of some sort be secured somewhere without much delay. The Flanders-Everitt interests agree to pay the interest on the Atlas bonds, but did not agree to assume the principal, which means if their venture proves successful the bondholders will lose nothing, while if it failed they will receive only what may be realized from the sale of the property, which conditions make the promise held out by Thomsen much more attractive and worth waiting for.

Not the least interesting situation brought about by the Atlas failure concerns the future manufacture of Knight engines for the trade at large. The Atlas company is possessed of the only Knight li-

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cense of that sort, and several manufacturers who have announced Knight-engined cars, other than the three who are privileged to manufacture their own engines, have been depending on the Atlas factory for their power plants. Unless the successful bidder for the Atlas Engine Works continues to produce Knight motors, these several manufacturers will be left badly in the lurch. The Knight license, which cannot be sold separately, is among the assets of which the successful bidder will become possessed. The same is true of the rights to the Atlas-type Diesel engine.

According to the receiver's appraisement of the Atlas property, its valuation is $1,356,723, made up as follows: Cash on hand. accounts, etc., $234,905; buildings, $518,056; real estate, $117,600; machinery, $351,845; sprinkling and water system, $50,000.

Court Orders Sale of Mais Plant.

August 19th has been set by the Federal court as the date for the sale by the receiver of the assets of the Mais Motor Truck Co., of Indianapolis. A condition of the sale requires payment of at least one-third in cash. In round figures, the assets of the bankrupt company are $250,000. The liabilities, including notes given for new capital, approximate the same amount. Included in the assets are several trucks which are practically completed, machinery and real estate, the value of which is more than $200,000, listed at original cost.

Wise to Market the Touraine "Six."

S. J. Wise & Co., of New York, who hitherto have handled the Amplex car in the eastern half of the country, are having built for them by a well known eastern manufacturer a six-cylinder car, which will be styled the Touraine and which will be marketed under the firm's name. It will list at $2,950, fully equipped. In addition, Wise & Co. will handle the Paige-Detroit as a popular priced model.

Keetons To Be Reproduced in Canada.

Keeton Motors, Ltd., is the title of an offshoot of the Keeton Motor Car Co., of Detroit, which has been organized in Brantford, Ont., where a factory has been acquired and where Keeton cars will be reproduced for the Canadian trade. The new company is capitalized at $200,000 and is reported to include in its make-up some of the members of the powerful Massey-Harris Co.

General Motors Anticipates Its Loans.

Having anticipated payment of all of its loans, and reflecting its condition, the General Motors Co. is now preparing to pay to the Central Trust Co., of New York, as trustee of its 6 per cent. first lien note issue, $1,000,000, which will be applied for the redemption of notes to the value of $1,500,000, which are payable to the trustee. These notes do not fall due until October 1st.

MEN WHO HAVE SHIFTED POSITIONS

Resignations and Promotions That Served to Place Many Workers in New Places —Few Leave the Trade.

W. J. Lawrence has been appointed manager of the Minneapolis branch of the Moline Automobile Co., of East Moline, Ill. Previously he was connected with the Studebaker branch in that city.

William J. Slater has been appointed assistant sales manager of the Michigan Buggy Co., of Kalamazoo, Mich. Formerly he was advertising manager of the Firestone Tire and Rubber Co.

J. V. Hall has been appointed sales manager of the Olds Motor Works, of Lansing, Mich. Previously he was manager of the Olds branch in Chicago. He succeeds to the vacancy caused by the resignation of Rupert E. Paris.

S. Henderson, for the past year chief inspector for the Studebaker Corporation, has resigned that position to join the Everitt Motor Car Co. He will have charge of the Everitt service department which is to be established in New York City.

E. Q. Cordner, who has been sales manager for the American-Marion Sales Co., of New York, since its organization, has resigned to become manager of agencies for the R. & L. Co., of New York, general Eastern distributers of the Garford product.

L. E. Kraft has been appointed manager of the Cadillac branch in Kalamazoo, Mich., to fill the vacancy caused by the resignation of H. M. Gilbert. Previously, and for a number of years, Kraft has been connected with the Cadillac agency in Detroit.

James F. Kennedy has been appointed a travelling representative of the Goodyear Tire & Rubber Co., of Akron, O. He will circulate in the States of Pennsylvania, Ohio, Indiana, Kentucky and Tennessee, making the Goodyear motor tire his specialty.

Raymond Cavanagh has been appointed advertising manager of the Moline Automobile Co., of East Moline, Ill. He has had wide experience in the advertising field, having at various times been connected with well-known advertising agencies in Chicago.

Frank B. Hart has been appointed manager for the Simkin Mfg. Co., of Chicago, manufacturers of the Daisy lighter, which company is undergoing reorganization. Hart for years was identified with the Excelsior Supply Co. of Chicago, where he is well known.

Frank A. Groves, president and general manager of the Speedwell Motor Car Co. of Illinois, has been appointed sales manager of the parent company of that name in Dayton, O. Groves is not strange to Dayton, where for years he was identified with the National Cash Register Co.

M. A. Sacksteder and C. H. Potter, respectively manager and assistant manager of the United Motor Dallas Co., have resigned those positions in order to engage in the automobile business in Dallas, Tex., on their own account. They are organizing a company, which will be styled the American and Marion Co., and will handle cars of those names.

E. B. Fleisch, general manager of the Long Mfg. Co., of Detroit, makers of radiators, has resigned that office, and it is understood that he will return to the railway supply business, in which he previously was engaged. His duties will be divided among various offices of the company. J. L. Dryden is now looking after the sales and advertising departments.

H. E. Shiland has been appointed assistant general manager and director of sales for the Havers Motor Car Co., of Port Huron, Mich. Shiland has been connected with the industry for some twelve years, until about two months ago having been sales manager of the Westcott Motor Car Co., of Richmond, Ind., after having served for years as sales manager of the Buick Motor Co.

Ernest Coler, who has been a member of the John N. Willys staff for some time, has been appointed advertising manager for the Willys group of automobile factories. He will supervise the work of the Garford, Gramm and Willys-Overland companies, making his headquarters at the factory of the latter in Toledo. Before going to Toledo, Coler was assistant advertising manager for the United States Motor Co. in New York City.

C. J. Corkhill has been appointed assistant sales manager of the Cole Motor Car Co., with headquarters in Omaha, Neb. He will have charge of the territory bounded by the Mississippi River on the east, Gulf of Mexico on the south, Rocky Mountains on the west and Canada on the north. J. R. Moler has been given the same title and will have charge of the territory west of the Rockies. He will have no stated headquarters, but will circulate constantly among Cole agents in that district.

To Build Motor Wagons in Maine.

C. H. O'Brien, who was vice-president and general manager of the Kennebec Mfg. Co., of Hallowell, Me., is forming a company for the manufacture of motor wagons. For the purpose, he has purchased the buildings previously occupied by the Kennebec company.

Disputed Top Contract Leads to Law.

As the outgrowth of a disputed contract for tops, suit for $5,000 has been brought by C. V. Taylor, of Pontiac, Mich., against the Studebaker Corporation. Taylor claims $3,500 for goods delivered and asks damages for the rest of the unfilled contract.

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THE WEEK'S INCORPORATIONS




Moline, Ill.—John Deere Wagon Co., under Illinois laws, with $500,000 capital; to deal in vehicles, etc.

Sioux City, Ia.—Mandel-Frisch Auto Repair Co., under Iowa laws, with $5,000 capital; to deal in motor cars.

Detroit, Mich.—Detroit Body Co., under Michigan laws, with $1,000 capital; to manufacture automobile bodies.

White River Junction, Vt.—Vermont Cadillac Co., under Vermont laws, with $500 capital; to deal in motor cars.

Oswego, N. Y.—Oswego Essenkay Co., under New York laws, with $1,500 capital; to deal in tire fillers, etc. Corporators—A. P. Murdoch, A. V. Radcliffe, C. C. Place.

Cheek Spring, Va.—Cheek Spring Motor Co., under Virginia laws, with $50,000 capital; to deal in motor cars. Corporators—C. E. Hooper, C. L. Lambert and others.

Indianapolis, Ind.—Indianapolis Tire Co., under Indiana laws, with $300,000 capital; to manufacture tires. Corporators—A. A. McKain, E. J. Holliday, D. M. Parry.

Madison, Wis.—Madison Motor Bus Co., under Wisconsin laws, with $5,000 capital; to operate a motor bus line. Corporators—Fred W. Coombs, Paul Kney, Harry J. Parke.

Grafton, W. Va.—Grafton Garage Co., under West Virginia laws, with $2,900 capital; to operate a garage. Corporators—Henry J. Pracht, H. D. Comerford, Albert Kunst.

San Francisco, Cal.—Little Automobile Co., under California laws, with $20,000 capital; to deal in motor cars. Corporators—W. R. Huff, John Johnstone, J. E. Little.

New York, N. Y.—Oil Converting Co., under New York laws, with $10,000 capital; to manufacture motor devices. Corporators—A. T. Porter, W. D. MacLauren, O. W. Shinn.

Cincinnati, Ohio—Swing Wheel Co., under Ohio laws, with $50,000 capital; to manufacture motor car wheels. Corporators—A. J. Swing, R. E. Werner, R. H. Langdale.

Hudson, N. Y.—Warren Street Garage Co., under New York laws, with $6,000 capital; to operate a garage. Corporators—John F. Hester, Henry B. Hester, Dennis Hester, Jr.

Camden, N. J.—Service Motor Truck Co., under New Jersey laws, with $50,000 capital; to manufacture motor trucks. Corporators—R. S. Smith, C. D. Hackett, E. J. Eldredge.

Chicago, Ill.—Herreshoff Motor Co. of Illinois, under Illinois laws, with $500 capital; to deal in motor cars. Corporators—W. G. Wordingham, Charles H. King, E. G. Lancaster.

Westfield, N. J.—Darby Motor Car Co., under New Jersey laws, with $25,000 capital; to deal in motor cars. Corporators—Levy Douglass Darby, Hatty C. Darby, Aaron B. Darby.

Springfield, Ill.—McDonough County Automobile Association, under Illinois laws; to better road conditions. Corporators—Joseph B. Bacon, T. H. Downing, Edward C. Wolff.

Bridgeport, Conn.—A. L. Schavoir Co., under Connecticut laws, with $3,000 capital; to deal in motor car supplies. Corporators—A. L. Schavoir, Ernest Oliver, Joseph E. Lannon.

Newark, N. J.—Warwick Motor Co., under New Jersey laws, with $125,000 capital; to deal in motor cars. Corporators—James D. Nocel, E. Orton Woodrutt, Merton E. Hidden.

Boston, Mass.—Plymouth Garage and Machine Co., under Massachusetts laws, with $10,000 capital; to operate a garage. Corporators—Adoniram J. Smith, Ruth E. Kingan and others.

Owensboro, Ky.—Ames Motor Car Co., under Kentucky laws, with $100,000 capital; to manufacture motor cars. Corporators—F. A. Ames, Owensboro, and G. W. Yeoman, Detroit, Mich.

Pasadena, Cal.—Pasadena Essenkay Sales Co., under California laws, with $5,000 capital; to deal in tire fillers. Corporators—Alexander Holland, J. C. Hasbrouck, Jr., Etta B. Savage.

Salem, Mass.—Motor Sales and Service Co., under Massachusetts laws, with $25,000 capital; to deal in motor cars. Corporators—George B. Mason, Ellsworth S. Adams, George B. Kinsman.

Cincinnati, Ohio—Acme Motor and Delivery Co., under Ohio laws, with $15,000 capital; to deal in motor cars and operate a motor delivery service. Corporators—William Ernest Minor and others.

Philadelphia, Pa.—Auto Distributers, Ltd., under Pennsylvania laws, with $200,000 capital; to deal in motor casr. Corporators—F. H. Hansell, I. C. Clow, John A. MacPeak, all of 419 Market street.

Cleveland, Ohio.—Knox Rubber and Supply Co., under Ohio laws, with $10,000 capital; to deal in motor accessories. Corporators—R. A. Lang, C. S. Wachner, H. H. Burton, A. G. Dole, F. F. Blaize.

Camden, N. J.—Garrison Gasolene Engine Specialties Co., under New Jersey laws, with $125,000 capital; to manufacture gasolene motors. Corporators—F. A. Kuntz, F. S. Sauerman, F. S. Muzzey.

Paterson, N. J.—Paterson and New York Motor Express Co., under New Jersey laws, with $50,000 capital; to operate a motor delivery service. Corporators—John M. Simpson, Mary Brooks, Henry Smith.

New York, N. Y.—Autodrome Co., under New York laws, with $50,000 capital; to promote motor racing exhibitions. Corporators—Harry L. Curran, Clara D. Curran, Coney Island; Benjamin B. Jones, New York City.

New York, N. Y.—William Strathmann, Inc., under New York laws, with $5,000 capital; to deal in motor vehicles. Corporators—William Strathmann, 2906 Broadway; Herman C. Berkemeyer, John H. Semken, both of 2794 Broadway.

Buffalo, N. Y.—Mutual Motor Car Co., under New York laws, with $12,000 capital; to deal in motor cars. Corporators—Albert Poppenberg, 247 Bryan street; Frederick C. Carter, 4 Fargo avenue; Orson E. Yeager, 419 Richmond avenue.

Esopus, N. Y.—L-M-S Motor Co., under New York laws, with $10,000 capital; to deal in motor cars. Corporators—Herbert Cohen, 140 West 111th street, New York City; Emil Akder, 41 Convent avenue, New York City; Joseph J. Baker, 456 Riverside Drive, New York City.

New York, N. Y.—Standard Automobile Co., under New York laws, with $10,000 capital; to deal in motor cars. Corporators—Earle H. Frichtman, Montclair, N. J.; Henry D. Chapin, 647 Fox street, New York City; Jule L. Janover, 214 West 129th street, New York City.

New York, N. Y.—Automobile Importers' Alliance, Inc., under New York laws, with $750 capital; to deal in motor products. Corporators—George J. Ginsburg, Rutherford, N. J.; Herbert L. Wymer, Rosedale, L. I.; Bernard C. Wymer, 602 West 137th street, New York City; Henry W. Showers, 15 Wall street.

Changes of Corporate Name.

Peoria, Ill.—Starbuck Motor Co. to C. W. Robinson & Co.

Racine, Wis.—Racine Rubber Co. to Belle City Rubber Co.

Washington, D. C.—Bowles Motor Sales Co., to Warren Motor Sales Co.

Bridgeport, Conn.—Eddy Sherwood Carriage and Motor Co. to Jennings Sherwood Carriage and Motor Co.

Milwaukee, Wis.—Luick-Bassett Producer Co. to Sharp-Bassett Gas Producer Co.

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ODD OUTGROWTH OF BANKRUPTCY

After Signing Composition, Thermoid Discovers Real Meaning of 35 Per Cent.—Seeks to Enforce Its Understanding.

Although the New York Royal Rubber Co., which at one time operated on Murray street, New York City, has been adjudicated a bankrupt, its financial troubles are by no means ended, as the Thermoid Rubber Co., of Trenton, N. J., maker, among other things, of the Merit tire, is suing in the New York City Court to recover from Max Weingarten, Henry Durst and Max Durst, the Royal Rubber promoters, on a bill for $1,800, alleging a misunderstanding in the bankruptcy proceedings. When the Royal Rubber company found itself financially involved it formulated a composition whereby the creditors were to get 25 per cent. cash and 10 per cent. on an endorsed note. The Thermoid claim is that when papers of consent were submitted to it the amount named in the document was $630, or 35 per cent. of the $1,800, and that the Thermoid company signed up supposing it was agreeing to accept $630. However, in the bankruptcy proceedings, the Thermoid people allege, they discovered that they had stipulated that $630 was their total bill, and on this basis they were paid 35 per cent. of $630, getting, they claim, only 35 per cent. of 35 per cent. of their real claim. When no satisfactory agreement was reached in the bankruptcy proceedings, the action in City Court was commenced.

Delay in Chassis Delivery Causes Suit.

Delay in delivering to James A. G. Pennington, of Norfolk, Va., a 5-ton Mercedes-Daimler truck chassis which he ordered from the Daimler Import Co., of New York City, November 20, 1911, is named as the basis for an action commenced last week in the New York City Court, wherein the man from Virginia demands $1,932. He alleges that he paid $2,000 on the chassis and that it was to be delivered January 1, 1912, but thus far has failed to appear; also he says he has demanded his money back and it has been refused. Admitting he owes the Daimler people a bill of $68 for supplies, he deducts this amount and asks the court to award him $1,932.

Million Dollar Spring Tire in Spokane.

Out in Spokane, Wash., the good old spring tire has caused sufficient hope to rise in the breasts of several men to enable them to see at least "a million in it." They have incorporated the Fox Spring Tire Co., capitalized at $1,000,000, of which Porter C. Fox, the inventor, is president. The other officers are: D. D. Woolsey, vice-president; W. E. Allen, secretary; Frederick Allgaier, treasurer, and Dallas J. Cogdill, manager.

In addition to the usual combination of steel springs, it is stated that the Fox tire has for a tread "an endless steel chain, composed of a series of short links, said to give resiliency equal to a pneumatic tire," and which also will prevent skidding. The company has opened an office at 415 Sprague avenue, Spokane.

Mercer Discontinues Scapegoat Case.

An order of discontinuance was filed last week in the action brought by the Mercer Automobile Co., of Trenton, N. J., against the Auto Credit Co., of New York City, to determine the possession of a car which, as previously told in Motor World, figured in the escapade of a New York bank president's son. He bought the car, it is claimed, paying for it with a check which his father's bank refused to honor, and the car was subsequently found in the possession of the defendant, from whom it was replevined. The terms of settlement were not made public.

United States Tire Prepares to Move.

The magnificent 20-story white marble structure at Broadway and 58th street, New York, erected by the United States Rubber Co., having been wholly completed, the United States Tire Co., one of its subsidiaries, on or about August 15th will move from its present location across the street. The tire company will occupy the basement and sub-basement as stock rooms, the ground floor for its New York branch and the 15th, 16th and 17th floors as general offices.

J. & B. Succeeds Jacobson-Brandow.

The J. & B. Mfg. Co., of Pittsfield, Mass., which has succeeded the embarrassed Jacobson-Brandow Co., of that city, and which acquired the latter's plant, has added a lamp regulator and a master vibrator to its productions. It also is continuing the manufacture of the Jacobson-Brandow coils.

Oakland Opens New England Branch.

The Oakland Motor Car Co., of Pontiac, Mich., has established a branch in Boston, Mass., which temporarily is located at 591 Boylston street. It is in charge of L. J. Sackett, who has been identified with the automobile industry almost since its inception, latterly with the Cadillac Automobile Co. of Boston.

Mercer Plans Addition to Factory.

Contracts have been let for the construction of an addition to the Mercer Automobile Co.'s plant in Trenton, N. J. The new structure will be of the sawtooth type, 160 x 161 feet. It will be employed for assembling, finishing and painting purposes.

Branch for Lee Tires in St. Louis.

The Lee Tire & Rubber Co., of Conshohocken, Pa., makers of Lee tires, has established a branch in St. Louis at 3567 Linden boulevard. It is in charge of B. O. Leftwich.

TWO TIRES MAKE MUCH TROUBLE

Dispute Between Dayton and Schleicher Over Small Amount Leads to Litigation—Contempt of Court Charged.

When two "airless" tires left the factory of the Dayton Rubber Mfg. Co., in Dayton, O., consigned to the Schleicher Motor Vehicle Co., several months ago, none expected them to be the basis of a lawsuit which would keep the New York city courts busy for months and develop into a second action over the cost of the first suit.

The second section was to have had an airing in the New York City Court yesterday, when the Dayton company made ready to move for an examination of the Schleicher company in supplementary proceedings for contempt of court because, it is claimed, the Schleicher concern has failed to pay a judgment of $25 costs awarded the Dayton company when that concern won out in the original action. The motion, however, was adjourned for a week, and there are reports of a pending settlement. The trouble began after the Schleicher company bought two tires, it subsequently being claimed that they were defective, and suit for a recovery under the guarantee was instituted. The Schleicher company was defeated in the Municipal Court and carried the case to the Appellate Term, where it again lost, and was directed to pay $25 costs, and this amount is the basis of the present litigation.

Burglars Figure in Green's New Answer.

Arthur H. Green, who does business at 1686 Broadway, New York City, as Arthur H. Green & Co., filed an amended answer yesterday in United States District Court for the Southern District of New York in the suit brought against him by the K-W Ignition Co., of Cleveland, O., for the value or return of goods consigned to him about a year ago as New York representative of the concern. The amount asked is $4,367. Green's answer is that some of the goods in question have been sold, some he still has, while others were stolen by burglars. He asks that the complaint be dismissed with costs. The trouble arose over Green's alleged failure to make a weekly accounting and to keep up his payments according to the contract. In his original answer he set up an allegation of defective goods as his principal defense.

Offers New Nameplates for Old Cars.

Awakened to the fact that the name Studebaker has been so greatly subordinated as to be scarcely recognizable on its own productions, the Studebaker Corporation is now counteracting that state of affairs as far as possible. To that end it is offering to all owners of E-M-F "30" and Flanders "20" cars new nameplates, which, instead, bear the name Studebaker.

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G. H. Derry has opened a garage in Lamoni, Ia.

Fred Mellor has opened a garage in Liberal, Mo.

W. M. Burton is about to build a garage in Bethany, Mo.

J. B. Roach is about to build a garage in Van Buren, Ark.

John Noller has bought the Wilson Garage in Alma, Kan.

The Automobile Supply Co. has been organized in Miami, Ariz.

Lew Roberson has purchased property and will erect a garage in Ames, Ia.

D. R. McClary of Taft, Cal., has sold his garage on Main street to W. F. Von Breyman.

J. F. Avenell of Fowler, Cal., is about to erect a concrete garage at Merced and 8th streets.

William Sheridan has purchased the O. B. Thomas Garage at Seventh street and Broadway, Concordia, Kan.

R. Shaffer, Jr., of Merced, Cal., is making ready to build a garage on Huffman street, between Main and 15th.

The Methodist Church in Plymouth, Ind., has been sold to Lawrence Bros. who will transform it into a garage.

Patrick Donaldson has established an agency and garage in Moorhead, Minn. He will handle the Warren-Detroit line.

Koehler & Hanson, hardware merchants in Odebolt, Ia., are to build a garage adjoining their present place of business.

E. W. Ruppelt, of Marshalltown, Ia., has purchased the Grout Building from C. E. Alden and will convert it into a garage.

M. L. Harmon of Bloomington, Ind., has bought property on West Kirkwood avenue and will open a garage and salesrooms.

A garage just completed in Corcoran, Cal., by Frank A. Cleveland has been leased by J. B. Peel of Tulare, in the same state.

C. Brooks, owner of the Union Garage in Croville, Cal., has sold out; C. L. Martin, the purchaser, will continue the business.

Edgar Conger and Edward Asplund of Macomb, Ill., have entered the automobile livery business; at present they have but one car.

C. E. McWilliams of Chillicothe, Mo., is about to enter the automobile trade; his business will be styled Chillicothe Auto & Supply Co.

Under the style Carolyn Garage, P. F. Gillett has entered the trade in Turlock, Cal. His location is on East First street near Olive.

Frank D. Cliber and Andrew T. Stone, Jr., have purchased a site on Walnut street Hollidaysburg, Pa., and will erect a garage, 50 x 70 feet.

H. R. Vogel, F. B. McCord and L. H. McMahon, of Carrington, N. D., have formed a co-partnership under the style Bull Dog Garage.

Adam Gilles of Minneapolis, Minn., has been granted permission to erect a one-story brick garage at Powderhorn Park; it will cost $2,500.

The White Front Garage on Park avenue, Niles, O., has changed hands; James Heathman succeeds Swegan & Heathman, the former owners.

The Allen-Ahern Auto Co. of Monticello, Ark., has opened a branch in Warren, in the same state; Joseph McClerkin of Monticello is in charge.

W. W. Overholser of Sibley, Ia., has sold his interest in the Sibley Auto Co. to his partner, Alfred Morton; the latter will continue the business.

G. L. and J. M. Bryson have purchased the Oskaloosa (Ia.) Garage from Robert Ramsey and Howard Taylor; G. L. Bryson will manage the business.

F. G. Withrow and G. E. Finch of Akron, O., have opened a tire repair shop at 15 Library avenue, Grand Rapids, Mich. They have the Republic agency.

Al. Stader, editor of the Ankeny (Ia.) Times, has increased his activities by adding automobiles; he has opened a garage and will handle the Krit car.

F. R. Singlehurst, the owner of two garages in St. Petersburg, Fla., is about to erect a third; this one will be located at Central avenue and 8th street.

Alexander Stewart is erecting a garage, 50 x 135 feet, in Escondido, Cal., on North Lime street, between Grand and Ohio avenues; he will open September 1.

J. S. Waterland and C. A. Andrews of Chico, Cal., have secured permission to build a garage, 124 x 98 feet, at Broadway and 6th street; it will cost $6,000.

Kaukauna Motor Sales Co. is the style to be assumed by a newcomer in Kaukauna, Wis. T. W. McFarlane will be manager and will handle the Marathon car.

Potts Garage is the style under which a new business has opened up in Peoria, Ill., on Margaret street near 4th; the building will accommodate twenty cars.

Farmers Garage is the style of a new business in Plainfield, N. J., on Somerset street, near the North Plainfield line; Wheeler & Titus are the proprietors.

J. P. Shropshire is about to build a garage, 50 x 80 feet, on Broadway, Glendale, Cal. It will be operated under the style Broadway Garage, by Bruce & Waite.

Under the style Kinkler Auto & Supply Co., a new addition to the trade has opened up in Chanute, Kan. Its garage and store is located at 112 North Lincoln street.

J. Witt, J. P. Branck and the Higginsen Co., of San Francisco, Cal., are preparing to erect a two-story garage, 165 x 50 feet, on West Valencia street; it will cost $15,700.

M. H. Perin, of Cincinnati, O., has secured from Samuel Hannaford & Sons, architects, plans for a garage and salesrooms. They will be located on Race street.

J. R. Poole is about to build a one-story garage, 50 x 58 feet, at 12-14 Marshall street, Somerville, Mass. It will be of terra-cotta and will represent an expenditure of $4,000.

Permission has been granted to August Hinn, of Chicago, Ill., to build a one- and two-story garage at 2033-35 West North avenue; it will represent an expenditure of $10,000.

William Whipple of Altamont, N. Y., has purchased a horse livery business in that town and in addition will conduct an automobile livery; his garage is on Prospect Terrace.

Curle & Hayes's barn in Kingsbury, Cal., has been leased to a company which will operate a garage therein; a Mr. Bigelow of Oakland is a principal promoter of the venture.

William Schmidt of College Point, Long Island, N. Y., has secured permission to build a garage, 50 x 100 feet, at 2d and 9th avenues; the plans call for an expenditure of $10,000.

Frederick W. Davis and his sons, Harold C. and Fred L., have entered the trade in Fall River, Mass., under the firm style F. W. Davis & Sons.; they have the Henderson agency.

W. H. Thomson, a San Francisco automobile salesman, has branched out for himself with an agency in Oakland, Cal., "across the bay"; he will handle Alco, Velie and Paige cars.

The Sterling Building and Operating Co. is about to erect a three-story garage, 75 x 90 feet, on Wadsworth avenue, near 176th street, New York City; the cost is estimated at $40,000.

Murray E. Long of Gettysburg, Pa., has purchased the Cresent Automobile Co.'s garage from C. B. Reddig, the former owner; Long has taken possession and will conduct the business.

Mullen & Hunter, machine shop operators in Gilmore City, Ia., have secured plans for a garage to be built adjoining

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their plant; it will be 50 x 124 feet and of brick construction.

Thomas Vreeland, formerly foreman in several local garages in South Bend, Ind., has opened up for himself at 301-3 East Jefferson boulevard; under the style People's Garage he will operate a taxicab service.

Motor Equipment Co. is the style of a new business which has opened in Oakland, Cal., at Twenty-second street and Broadway, under the management of William S. Bacon; Kelly-Racine tires will be stocked.

A garage, 40 x 60 feet, is about to be erected in La Porte City, Ia. When completed it will be leased to E. H. Mahoney of Cedar Rapids, in the same state, who will, with a partner, establish an automobile business.

Edwin Graff of San Leandro, Cal., is about to build a garage at San Lorenzo avenue and Hepbourn street; J. B. Mills of that town has leased it and will embark in the garage business as soon as the structure is completed.

The Hudson-Phillips Motor Car Co. has succeeded the Phillips Automobile Co. as Hudson distributer in St. Louis, Mo.; John H. Phillips remains the head of the new company, which temporarily is located at 5802 Delmar boulevard.

Charles P. Landman, formerly connected with the Blevins Auto Sales Co., in Toledo, O., is about to incorporate a company for the sale of motor cars in Northern Ohio; among the lines mentioned as a part of the new agency's stock is the Flanders electric.

Edward Bonnheim and Harry Moore have formed the Bonnheim-Moore Motor Car Co. and will handle the new Henderson car in San Francisco, where both are well known to the trade; negotiations are pending for a site on Golden Gate or Van Ness avenue.

W. A. Latham who has been conducting a garage at Court street and Dearborn avenue, Kankakee, Ill., has closed out his business and left for larger fields; he is to secure an automobile agency for several states with Kansas City, Mo., as headquarters.

The Foss-Hughes Co., Pierce-Arrow dealer in Philadelphia, Baltimore, Providence, Wilmington and Newport, is about to invade Washington, D. C., and will locate at 1220 Connecticut avenue. The establishment will be ready for business by September 1.

The Grand Rapids Taxicab Co., under the management of C. A. Knapp, is the style of a new transportation concern in Grand Rapids, Mich. The equipment consists of six Ford cabs; an office will be maintained in connection with that of the Willis Transfer & Baggage Co.

The English Motor Car Co. has been incorporated in Los Angeles, Cal., and has taken over Stevens-Duryea representation in that city. P. A. English is president and Clarence A. English, secretary and general manager. Broc electrics will supplement the Stevens-Duryea line.

P. W. Devendorf, who has been in the automobile trade in Lafargeville, N. Y., for nine years, has increased his interests by assuming control of the Arsenal Street Garage in Watertown, in the same state; associated with him in this latest venture is William Matthews of Lafargeville.

The Lion Motor Sales Co., of 650 Woodward avenue, Detroit, has been reorganized under the style Postal-Fair Motor Co., the title being derived from the names of the principals, H. F. Postal and R. E. Fair; the company will handle the Peerless, Lion and Michigan cars. Postal previously was connected with the Lion company.

White cars hereafter will be sold in Manitoba and Saskatchewan by the White Motor Co., which has been organized for that purpose and which will have headquarters in the Imperial Garage, Osborne place, Winnipeg; E. Chevier and W. E. Roby are the principals in the new concern. The agency has been held for two years by William Richardson of Portage la Prairie.

Arthur Wheeler, formerly assistant manager of the Franklin Automobile Co.'s branch in Syracuse, N. Y., has entered business for himself in that city at 103 Lexington avenue; he takes over the location and Stoddard-Dayton business formerly in the hands of A. M. Zimbrich, of Rochester, and will handle also Haynes cars and Gramm trucks with a line of bicycles and motorcycles.

Richard B. Darre, of 930 St. Nicholas avenue, New York City, formerly of the copartnership Darre and Baramy, which until dissolved in 1911 conducted the Sterling Garage, has filed a petition in bankruptcy, both as an individual and as a member of the firm, which has no assets; liabilities are $9,795 and assets, $265. William Hoffman of 516 West 143d street, who advanced money to the firm, is named as the principal creditor.

Sells Car for Note which is Protested.

Whether it is better to be the owner of a second-hand automobile or the possessor of a note which has gone to protest is a question on which the Stein Tire & Rubber Co., of New York City, has little doubt, and since it parted with the car in exchange for the note, it is now suing the Motor Car Exchange, of New York, in the New York City Court to recover the face of the note, which was for about $700. The car was one which had been used by the tire company for some time, and the bargain was thought satisfactory until later events developed.

Publisher Obtains Two Judgments.

R. H. Donnelley, a publisher, of 227 Fulton street, New York City, and who handles considerable advertising in various directories and guide books, is the creditor in two judgments filed this week in the New York county clerk's office. One, for $38.41, is against the Kosterba Automobile Wagon Mfg. Co., while in the other the debtor is the Garage Service of America, and the amount is $25.01.

Goodyear to Build in Minneapolis.

The Goodyear Tire & Rubber Co., Akron, O., has leased a plot of ground at Hennepin avenue and 12th street, Minneapolis, on which it will erect a building of its own for the occupancy of its branch in that city. The structure will be of brick and concrete, three stories and basement, 57 x 167 feet, and will represent an expenditure of $65,000.

Viso Spark Plug Makers Incorporate.

The Rapp Mfg. Co., of Toledo, O., which manufactures the Viso spark plug, has been incorporated under the laws of that state with $15,000 capital stock. Its officers are as follows: August J. Hummel, president; Wesley S. Rapp, vice-president and sales manager; Chester D. Few, secretary, and Clifford D. Stone, treasurer and general manager.

Paige-Detroit Acquires Engine Plant.

The Paige-Detroit Motor Car Co., of Detroit, has acquired the plant at Leit and Larned streets, in that city, which at one time was occupied by the Gray Motor Co., which recently was released by the United States Motor Co. It will be devoted entirely to the manufacture of Paige-Detroit engines.

Unpaid Tire Bill Brings Judgment.

Judgment for $61.10 was entered in the New York county clerk's office this week against Joseph F. Cox, a Brooklyn garage operator, by the Diamond Rubber Co. of New York. The claim was for tires sold and delivered, and the action was brought in the Municipal Court.

Fisk to Double Capacity of Factory.

To obtain much needed room, the Fisk Rubber Co. has under construction additions to its plant in Chicopee Falls, Mass., which when completed will more than double its capacity. The largest of the new structures is a four-story brick building, 250 x 90 feet.

Willys-Overland Increase Approved.

The increase in the capital stock of the Willys-Overland Co., of Toledo, from $6,000,000 to $15,000,000, was formally approved by the Secretary of State of Ohio last week. The new capital will be used to enlarge the various Willys properties.

Bruce Buys Metal Stamping Plant.

C. Arthur Bruce, treasurer of the Streator Motor Co., of Streator, Ill., has purchased the plant of the Streator Metal Stamping Co. in that city. He paid $30,500 for the property.

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THE MOTOR WORLD

PUBLISHED EVERY THURSDAY BY

The Motor World Publishing Company

1600 BROADWAY, NEW YORK, N. Y.

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Subscription, Per Annum (Postage Paid) $2.00
Single Copies (Postage Paid) . . . . . 10 Cents
Foreign and Canadian Subscriptions $3.00
Invariably in Advance.

Postage Stamps will be accepted in payment for subscriptions. Checks, Drafts and Money Orders should be made payable to The Motor World Publishing Co.

☞Change of advertisements is not guaranteed unless copy therefor is in hand on SATURDAY preceding the date of publication.

Contributions concerning any subject of automobile interest are invited and, if acceptable, will be paid for; or, if unavailable, will be returned provided they are accompanied by return postage.

Cable Address, "MOTORWORLD," NEW YORK.

Entered as second-class matter at the New York Post Office, November, 1900.

NEW YORK, AUGUST 1, 1912

LESSONS OF THE FARM TRACTOR TRIALS.

Considered from the point of view of the farmer, the farm tractor trials at Winnipeg were interesting chiefly on account of the excellent work done, the low cost of operation and the outnumbering and outclassing of the time-honored steam traction engines. From an engineering point of view, however, the trials are uncommonly interesting because of the somewhat peculiar tendencies in design and construction that were made manifest.

Perhaps the most noticeable peculiarity is the general ignoring of motor car practice in the construction of tractors, and the reversion to types of motors and mechanism now considered almost obsolete, at least for high powers. Instead of multi-cylinder motors of moderate weight and moderate speed, such as reasonably might have been anticipated, the favored practice is to employ huge single or double cylinder motors running at slow speeds, with cylinders that seem enormous as compared with even the largest motor car cylinders. Mixing valves are given preference over float feed carburetters. A single speed, or at most two speeds, with one reverse, are obtained through extremely heavy gears. The ancient swiveling front axle is preferred to knuckle steering, and, in general, simplicity is carried almost to the point of crudity, and strength to the point of excessive weight.

What makes all this particularly interesting is the fact that the machines are built solely with a view to doing certain work and the design is absolutely uninfluenced by other considerations. It is well known that many motor car designers deplore the fact that the unmechanical public's opinion is permitted to influence to a very considerable extent the design of motor cars, and it will be particularly interesting to observe the trend in farm tractors, which doubtless will be designed solely to produce results.

It would appear, however, that the lack of restrictions upon the designer might, with advantage, lead to the adoption of more refinements than were in evidence at the Winnipeg trials. Even if the efficiency of the float feed carburetter is considered dearly bought at the expense of the extra complication, there is no apparent reason, other than economy in manufacturing cost, why there should be an almost total absence of spring suspensions on machines that are built expressly for use over rough ground. A single speed seems insufficient for a machine that has sufficient power to run at its maximum practical speed on a smooth road with its motor turning over very slowly, but which, without adequate gearing, must run its big motor quite fast in order to make a speed of four or five miles an hour.

Still another point that seems worthy of consideration is the ponderous weight of many of the tractors, running in some cases up to 15 tons. The mere moving of such masses over soft ground involves the expenditure of considerable fuel, which means money, and while it may be argued that weight is necessary in order to give traction, it is equally true that traction can be obtained by the use of suitable projections entering the ground and preventing slippage. There are no very serious mechanical difficulties in the way of constructing blades or "paddles" that can be adjusted to extend to any desired depth, and it would seem that the use of less material, but of a higher quality, and the consequent reduction of weight, would result in an economy of power and an all-round efficiency that would justify the extra expense. While the internal combustion tractor has reached a point where it is more economical than a steam engine used for the same purpose, there is opportunity for the application of some of the lessons that have been learned by designers anent efficiency and refinement.

WHY NOT SILENT COMMERCIAL VEHICLES?

It has been said that foreigners visiting New York—or any other large American city, for that matter—often express surprise at the vast amount of unnecessary noise that is permitted in the city streets, making comparisons, of course, with foreign cities where noise that is avoidable is not tolerated. It is not possible, in the nature of things, to prevent noise in business hours, but it is possible to eliminate a good deal of the more unpleasant racket.

For instance, there are many motor vehicles of the commercial classes that raise such a din as to be positive nuisances; the noise is not confined to any one type of mechanism, but is heard issuing from the vitals of all types of cars. That it is not entirely necessary is proven by the fact that other machines of the same general construction are comparatively quiet in operation—in fact, some are almost as silent as the average touring car.

It is of course impracticable to try to build huge trucks and omnibusses that will glide along like the proverbial shadows, but it is entirely practicable to build machines that will not be particularly and emphatically objectionable, and no doubt it will not be long before public opinion, which is content to growl and grumble for a long time before insisting upon remedies, is sufficiently aroused to bring about the results that can and ought to be obtained. It were well did designers forestall such action.

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REFUSES TO CONTINUE INJUNCTION

Would be Equivalent to Putting Taxicab Operators Out of Business, Says Court —Why Contract Was Violated.

That there may be some merit in the arguments for the defense in the action recently instituted by the American Taximeter Co. of New York in the Supreme Court for New York county against John Hefferon and John Kavanaugh, operators of the Circle Taxicab Co., of New York City, and the International Taxameter Co. of America, wherein the complainant seeks to enjoin the taxicab company from using any but the American's taximeters, is indicated in a decision handed down on Friday of last week by Justice Gavegan, refusing to continue a temporary injunction against the Circle company while the suit is pending. He points out that if the plaintiff's plea were granted it practically would serve to put Hefferon and Kavanaugh out of business. They have been using several International meters in violation of their contract, and the International company is therefore made a party to the suit on the ground that it had induced the taxicab operators to break the contract they had executed. The main point of the defense is that International taximeters were used because, following a business dispute, the American company refused to supply the taxicab company with meters. Judge Gavegan's decision, which interestingly discusses the oft-discussed subject of such contracts and injunctions, is as follows:

"This motion is to continue pendente lite a temporary injunction restraining the defendants Hefferon and Kavanaugh from using any other taximeter than that owned by the plaintiff, and the defendant International Taxameter Co. from interfering with the plaintiff's rights under the contract. Defendants Hefferon and Kavanaugh are the owners of several taxicabs, and on November 16, 1909, made a contract with plaintiff by the terms of which plaintiff leased to them five taximeters for a period of three years at the monthly rental of $6 each. It is further provided in the lease that defendants will pay for any damage caused to the taximeters by any means other than proper usage; that they will not use the taximeter of any other person, firm or corporation during the term of the lease, and, finally, that if the defendants fail to pay the rent or fail to perform any other act provided for in the contract, then the entire rental for the unexpired term of this contract shall be forthwith payable. Plaintiff claims a violation of that portion of the contract which provides that defendants Hefferon and Kavanaugh shall not use any other taximeter than that owned and leased by the plaintiff.

"Hefferon and Kavanaugh admit that they hired several taximeters from defendant International Taxameter Co., but claim that under the city ordinance requiring them to equip their cabs with taximeters they were compelled to do so by reason of plaintiff's refusal to furnish any more meters until defendants paid for the one damaged. I do not feel warranted in determining on this motion from the facts before me, and so leave for determination at the trial the question as to whether under all the circumstances plaintiff's refusal to furnish defendants Hefferon and Kavanaugh with a new taximeter was justifiable. There seems to be a sharp conflict, therefore, as to whether plaintiff has performed its part of the contract. If it has not it is not entitled to the relief sought, which rests in the sound discretion of the court and should not be granted in a doubtful case.

"The facts before me appear to be analagous to the facts in the case of Ringler Co. v. Mohl (115 App. Div., 549), where an injunction restraining defendant pendente lite from buying and selling upon the premises mentioned in the complaint any beer other than that brewed by plaintiff was reversed on the ground that plaintiff had an adequate remedy at law. The court, in its opinion, at page 551, said: 'In such a case a temporary injunction should not be granted unless it appears that doing the act during the pendency of the action will produce injury to the plaintiff. The effect of this injunction is to compel defendant to purchase the beer that he requires from the plaintiff. The only injury that his not purchasing the beer of the plaintiff will produce will be loss of profits. . . . If the injunction in its present form is allowed to stand, if the plaintiff refuses to sell the defendant's beer, the defendant will have to go out of business. The defendant can purchase no beer except that of the plaintiff, and there is no obligation on the part of the plaintiff to sell the defendant any beer at all.'

"So in the present case, if the affidavits of defendants are to be credited, plaintiff has refused to perform its part of the contract, leaving defendants nothing to do but seek elsewhere for taximeters in order to continue business. The damage which plaintiff will sustain is also more definitely fixed in this case by the terms of the contract itself, and I am unable to say from a reading of the contract with the conflicting affidavits that the consideration of advertising, the loss of which plaintiff claims is a very large element of its damage, was in contemplation of the parties. Moreover, it does not appear that the plaintiff has moved with diligence, for although plaintiff states in its moving papers that defendants commenced to use taximeters other than those supplied by plaintiff some time before this action was begun, it does not appear when such knowledge was brought home to the plaintiff. On the other hand, it does appear affirmatively that about nine months had elapsed since defendants Hefferon and Kavanaugh hired taximeters from defendant International Taxameter Co. of America.

"The case of Standard Fashion Co. v. Siegel-Cooper Co. (157 N. Y., 60), relied on by plaintiff to support its contention, has little or no application on this motion. There the decision was based on a demurrer to the complaint, and the Court of Appeals held, as I understand it, that if any portion of the complaint could be upheld as stating some facts entitling plaintiff to the intervention of a court of equity it should be dismissed. Here, however, the plaintiff is seeking an extraordinary remedy requiring more than mere allegations in a complaint which, if uncontradicted, would warrant the relief. Nor are the defendants Hefferon and Kavanaugh special agents to advertise plaintiff's products, as in the case of Butterick v. Chabot (128 App. Div., 900), but they are merely customers of plaintiff from whom, among others, it made its profits in the usual course of business. Motion denied."



August 1-3, Memphis, Tenn.—Fourth annual reliability run of the Memphis Automobile Trade Association.

August 3, Altoona, Pa.—Track races under the auspices of E. A. Moross.

August 3, Lansing, Mich.—Track races promoted by J. A. Sloan.

August 4, Bay City, Mich.—Track races promoted by J. A. Sloan.

August 7, Cleveland, Ohio—Track races under the auspices of E. A. Moross.

August 8-9, Chicago, Ill.—Trade vs Amateur drivers' reliability run, promoted by the Chicago Motor Club.

August 8-10, Galveston, Texas—Beach races under the auspices of the Galveston Automobile Club.

August 8-15, Minneapolis, Minn.—Reliability tour of the Minnesota State Automobile Association to Winnipeg, Can., and return.

August 11, Jackson, Mich.—Track races under the auspices of J. A. Sloan.

August 24, Uniontown, Pa.—Hill climb under the auspices of the Automobile Club of Fayette County.

August 25, Columbus, Ohio—Two-hundred-mile track race of the Columbus Automobile Club.

August 26-27, Flint, Mich—Track races under the auspices of E. A. Moross.

August 30-31, Elgin, Ill.—Road races under the auspices of the Chicago Automobile Club and the Elgin National Road Race Association.

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ALLEN STRONG FOR SMALL BORES

Returned American Criticizes Designers for Inattention to Engines of That Type —His Other Views.

According to Harry K. Allen, American designers and manufacturers are, to put it mildly, a couple of steps behind their British cousins in the march of progress that marks the automobile industry. Allen, who is intimately connected with the affairs of the Metallurgique Motor Co., of New York City, which, as its name signifies, handles the well-known make of Belgian car for which the company is named, just has returned from an extensive trip abroad. During the course of his peregrinations he visited all of the principal foreign countries, spending considerable time in England and at the factory of the Metallurgique company in Brussels, and as his trip was principally in the interests of business his opportunity for "looking around" and tracing some of the more marked tendencies to their special lairs was excellent.

Of course, everyone who has visited abroad, or who has had occassion to make critical examination of the most noteworthy differences between the American and foreign cars, has become acquainted as a matter of course with the great differences in bores and strokes — and in bores particularly—which obtains between the foreign productions and Amerisan cars. His remark to the effect that the small bore engine is viewed abroad as the coming type scarcely will occasion surprise, inasmuch as it has been with the development of this type of engine that the foreign designer has been chiefly concerned within the past few years. Similarly, the reason for the active development of the small bore engine which produces a comparatively small amount of power scarcely will require explanation. It is more or less well known that the horsepower tax abroad is excessive and the cost of gasolene has soared to a far greater extent than it has soared in America.

In connection with the cost of gasolene, however, it should be remembered that it is the general practice abroad to measure "petrol" according to the British standard imperial gallon, which contains approximately 1.2 gallons as gauged by the American standards; thus, though the cost of gasolene in England at present is approximately 32 cents, the fuel being sold in sealed 2-gallon cans, the actual cost of gaslene delivered figures out at the rate of approximately 27 cents a gallon, if the quantity in the can is measured according to the United States gallon.

"The foreign designer to-day", said Allen in discussing the matter with the Motor World man, "slowly but surely is eliminating the high power car from his line. There is no longer the demand for cars of, say, 40 to 60 horsepower that there was a few years ago, because it is coming to be generally recognized that it is possible to travel just as far and to climb just as high and to cover roads that are just as bad with an engine of from 10 to 20 horsepower as it is with a very much larger motor. Of course it is not possible to travel quite as fast, although this is not considered, principally for the reason that the speed laws abroad are very much more rigidly enforced than they are in America.

"The use of the small bore engine, of course, has two marked effects on operation in general, the first of them being that fuel consumption is low, and the second that the efficiency of the engines must be relatively high. It seems that the American designer is too willing to overcome difficulties by equipping his cars with a large motor and thereby gaining power at the expense of gasolene consumption and engine efficiency. The foreign designers, on the other hand, appear to have viewed the situation in a very much more logical light. Abroad, because of the high horsepower tax and the high cost of fuel, designers have preferred to take the small bore engine and by careful designing and consistent experiment to develop it to a point where the actual power developed is but very little less than the power developed by the more or less carelessly constructed low-priced American motor which nominally rates at twice its power. The direct result, of course, is that the efficiency of the small engine, both thermal and mechanical, is considerably higher than are the same factors in the American motor. I don't mean to say by this that there are no American motors which approach in efficiency the foreign products. It is true that there are some which are just as efficient, although they are of a larger and heavier type, which fast is coming to be considered obsolete abroad. But I do say without hesitation that the small American motor cannot compare in efficiency or workmanship with the small foreign built engine of the same rating which lists at the same price.

"Why is it that the small foreign motor is superior to the American motor? In the first place, the foreign designer has been designing motors for a greater number of years than has the American designer; consequently his experience is valuable. In the second place, handwork prevails in foreign factories to a very much greater extent than it does in the United States, and though the use of full automatic machinery undoubtedly is excellent practice and results in the standardization of parts and their production in such numbers as naturally reduces first cost to the minium, it is my opinion that handwork is superior to machine work. Also they use better materials abroad. There, metallurgists have been studying metals for a great number of years, whereas in America it is only within comparatively recent years that the study of such things as a science has been developed to a point where it is of any consequence. However, the relatively greater efficiency of the small bore foreign engine may be traced directly to the high horsepower tax and cost of fuel, the combination of which factors practically has forced foreign designers who want power coupled with efficiency and low cost of operation to develop a small bore engine rather than to adopt the slightly larger bore and thereby sacrifice efficiency. All other things aside, the adoption of the larger bore engine would require one of two things: That the purchasers of cars be burdened with greater taxes or that a fight be instituted to alter the laws which govern taxation of motor vehicles. The latter course holds such little hope as to be impracticable.

"Contrary to expectations, and to views which on several occasions have been expressed by others, the Knight type of engine does not appear to be gaining the headway abroad which generally is accredited to it. Quite naturally, most manufacturers of poppet valve engines look at it askance, and as naturally are inclined to sneer at it, though, as far as I could discover, it has been doing satisfactory duty wherever it has been adopted. Nevertheless, there seems to be an impression that though the engine operates well and satisfactorily, it has not been developed to a point of perfection comparable with the poppet valve engine. The concensus of opinion in this respect would seem to be best expressed by a remark credited to L. Renault, of the noted French house of that name: 'It has required more than 10 years of constant study and research to develop the poppet valve engine to its present status, and I don't see how any other type of motor can be developed in a shorter space of time.'

"Engine starting devices abroad have made little or no impression. Foreigners are inclined to view the acetylene type of starter as dangerous and, even when it is considered to be safe, it is not viewed in the light of a real engine starter, inasmuch as it is more or less of a mere priming device, which does not insure infallible starting. However, there are several American makes of acetylene starters on cars, both in England and other European countries, and so far as I can find out, they are giving fairly satisfactory service.

"The electric starter appears to be the coming thing abroad, as it is in America. Quite a number of foreign electric lighting and engine starting devices recently have made their appearance, though there is little attempt as yet to include such devices as stock equipment. This is not surprising, however, in view of the fact that there are few foreign cars which are sold equipped, as the word generally is understood in America. In other words, the foreign buyer purchases his chassis first, and afterward visits his body builder and either selects a body from stock to fit the chassis, or has

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one built to suit his own peculiar requirements. Incidentally, it is my opinion that there are no American bodies which can compare with those that are built on the other side. Why this should be so I don't know, but I do know that the lines of the foreign bodies are finer and that those manufacturers who specialize in enclosed types can and do produce limousines and landaulet bodies that, even after years of service, retain their pristine loveliness and give no evidence of rattles, such as are common in American bodies."

Size Cutting Follows Price Cutting.

Competition among American tire manufacturers is by no means cold, as was indicated by the alterations in prices made some months ago; but although there is business rivalry, there has not yet arisen the complaint which now emanates from the British Isles. It is said that because of the competiton between tire manufacturers the purchasers of tires are being given less than their money's worth. Deception is practiced, it is said, the favorite scheme of the deceivers being to make tires on which the true size is not stamped, the customer, however, being led to believe that the tire is of full size. The proof of the inferior offering, of course, comes out in service when the undersized equipment falls short of the mileage which might be expected.

The matter is understood to be in the hands of a committee of the Royal Automobile Club, whose object is to investigate the situation and make public its findings. England has suffered from price cutting, and the size cutting is believed to be an effort to keep up with former profits. Size cuts have been, it is said, as much as ten millimeters below the figures stamped on the casing.

Closed Street Bankrupts Garage Man.

Varied reasons are given for bankruptcies, but when a man has the pathway to his garage door effectually blocked he may be said to have a fairly good reason for declaring that he is unable to make ends meet, inasmuch as the rent keeps piling up and there is nothing coming in. Joseph J. O'Connor, who was located opposite Police Headquarters in Bridgeport, Conn., on Fairfield avenue, has filed a petition in bankruptcy, declaring that the closing of the street for repairs has completely destroyed his business. His shop was on the direct road between New York and Boston and business was at one time good, but it fell off as the street deteriorated and traffic was diverted to a better thoroughfare. When the pavement was torn up it was O'Connor's finish, according to himself. His assets and liabilities are, respectively, $500 and $2,598. Other business men on Fairfield avenue have suffered, too, while those on State street, which now gets the travel, are said to have met with a wave unwonted prosperity, much to the chagrin of the Fairfield avenue dealers.

RESILIENT WHEEL WITHOUT SPRINGS

Wheel Within Wheel Principle Applied in Novel Fashion by British Inventor—Torque and Gravity as Cushions.

The idea of a wheel within a wheel always has had a sort of fascination for inventors whose minds run on wheeled vehicles, so to speak, and there even were "push" bicycles built with one wheel within the other in the rear, though the first and last appearances of these machines were identical and simultaneous. Despite the fact, a new application of the principle recently has been made by an Englishman,

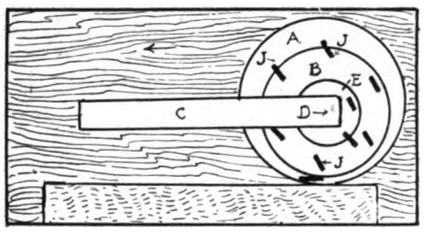


FIG. 1

W. S. Boult, of London, which differs in detail and in operation from the more familiar double wheel arrangements with intervening springs, rubber tires and so on.

The principles involved in the Boult wheel are diagrammatically indicated by the accompanying sketches reproduced from "Autocar." A rough cardboard model is represented, and it illustrates the principle involved, though in a crude way. The letters employed refer to the same parts in both figures. The main or outer wheel A is shod with a tire in the usual way; B is the inner wheel, to the center of which the driving shaft is connected. The propeller

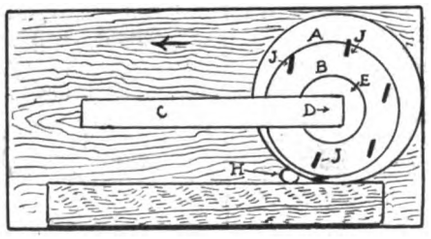


FIG. 2

shaft C drives the inner wheel B in the usual way through the bevel gear E; the live axle shaft is represented by D. It will be understood that the wheel is being viewed from the inside, or between the two rear wheels. Connection between the inner and outer wheels is established by means of a set of links, represented by J, so arranged that the inner wheel is free to maintain its position with center below that of the outer wheel, regardless of their simultaneous rotation.

Fig. 1 shows the relative positions assumed by the two parts of the double wheel when the car is running normally on a smooth road; the links J are inclined toward the rear and the inner wheel is a little above and to the rear of the position it would assume were the car stationary, the driving torque having the effect of partially overcoming the weight hanging on the links. Should the outer wheel encounter an obstruction in the road, however, the relative positions would be changed and would be as shown in Fig. 2, in which H represents the obstruction. The inner wheel would swing downward and forward, maintaining the rate of speed of the car, while the outer wheel would be momentarily checked, by mounting the obstruction, after which it would accelerate and assume its normal running position with relation to the inner wheel. The point is that these irregularities of motion, which ordinarily to a greater or less extent are transmitted to the car, are largely confined to the outer wheel, and that the relative movements of the two wheels are cushioned by the fact that the backward movement—or, to be correct, the retardation—of the outer wheel upon meeting an obstruction is cushioned against the torque of the driving shaft, which tends to keep the parts in the position shown in Fig. 1. This torque cushion, as it might be called, takes the place of springs in giving the wheel resiliency. It is claimed that should the outer wheel strike a large obstruction the inner wheel would swing down and then forward and high up and pull the outer wheel over the bump, and the torque cushion effect would prevent violent aftereffects. The resilience of such a wheel would not vary with the load carried, for the increased tractive effort made necessary by the increase of weight carried would balance the forces, and the inner wheel would maintain its position with reference to the outer wheel.

Whether the wheel will come up to the inventor's expectations when put into practical form and tested on the road remains to be seen; the idea is ingenious, however, and the principles involved are of not a little interest, not only because of the apparent possibilities of the design, but because of the wide differences that exist between the Boult wheel and other wheels designed to improve the riding qualities of the motor car.

Milwaukee Sanctions Portable Garage.

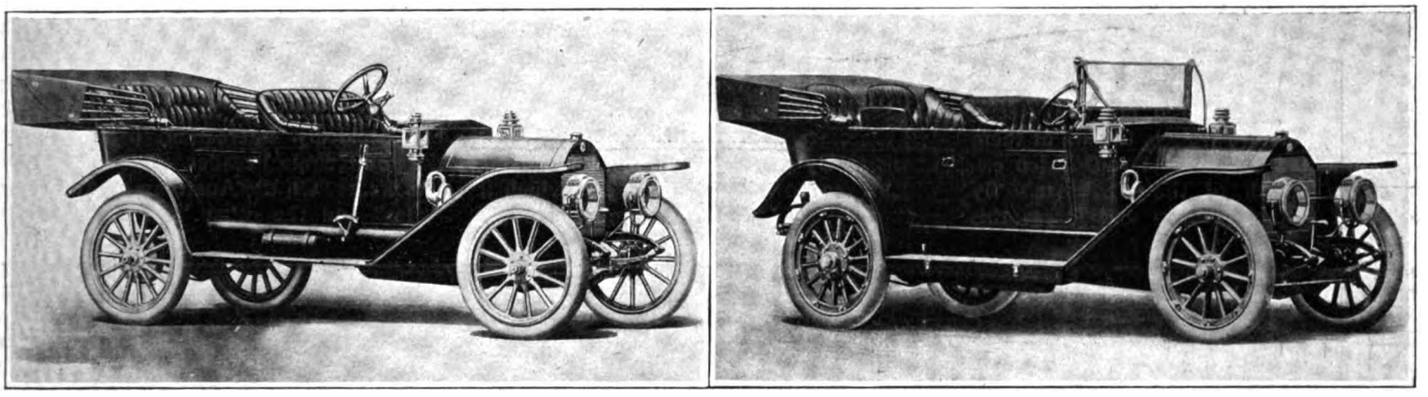
The problem which has confronted many of Milwaukee's automobile owners, especially those who dwell in rented houses, of how to avoid the charges imposed by garages for storage has been solved by an ordinance which went into effect last week whereby official sanction and permission is given for the use of the small portable steel garage such as would be suitable for individual service. The measure permitting this form of garage caused considerable discussion, though in support of it there appeared a representative of the garage manufacturers, who marshalled his forces in favor of the proposition and won.

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FEW CHANGES IN STODDARD-KNIGHT

New Front Axle and Lighting System Adopted; Wire Wheels Optional—Three Poppet-Valve Models Unaltered.

Permitting very nearly as much latitude for choice as might with reason be expected, the Stoddard-Dayton line, which is produced by the Stoddard-Dayton division of the United States Motor Co. in the factory of the Dayton Motor Car Co., of Dayton, O., will include for the coming season, as it has in the past, no less than three distinct types of motors. Chief among them is the six-cylinder Knight engine, which made its appearance late last year and which in the interim has sustained but one significant alteration in design, the slight change which has been made having been necessitated by the addition of a power-driven air pump. The other two motors which are employed in the other three chassis which go to make up the line are the block motor, which for the past several years has been used and still is used in the 30- and 38-horsepower cars, and the valve-in-the-head motor, which is rated at 48 horsepower and which represents some eight years of development in service in the largest poppet-valve engined car.

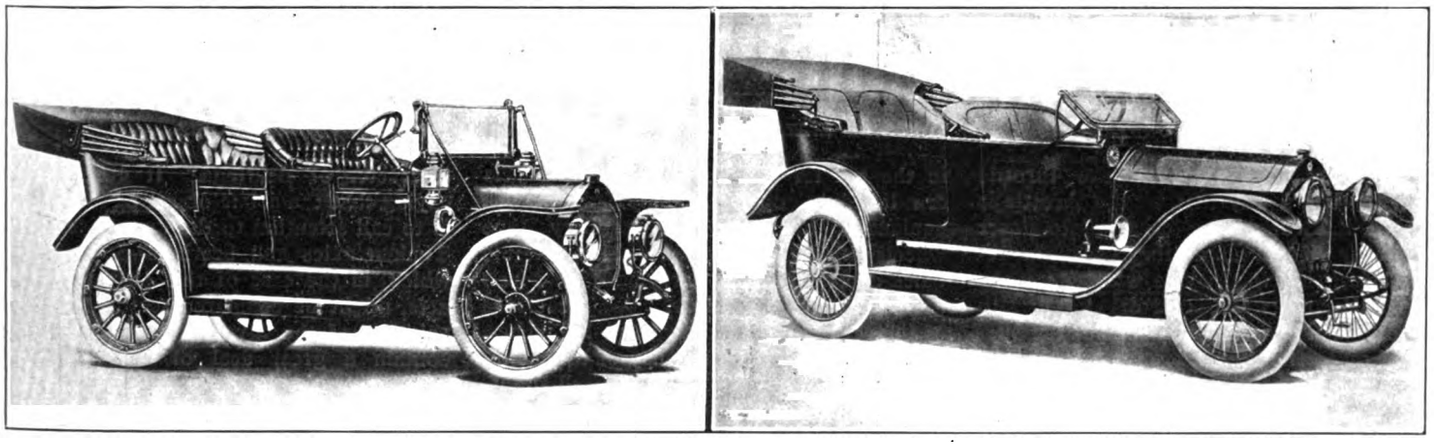


STODDARD-DAYTON 30-HORSEPOWER CAR AND THE FIVE-PASSENGER MODEL "38"

The cars themselves, as regards their essential elements, scarcely can be distinguished from their immediate predecessors, except by reason of slight alterations in the body lines whereby the general appearance has been enhanced and the comfort of passengers increased. All of the cars in the line are much improved in these respects, the bodies being roomier and presenting a more finely drawn appearance, which is thoroughly in keeping with the high standard of merit which the manufacturers have set for themselves and maintained. With the exception of the 30-horsepower model, which is the popular-priced car of the line, and is fitted only with touring and compartment roadster bodies, all the chassis regularly are supplied with any of the standard types of bodies, the prices, though including even more equipment than was included last year, remaining the same. The Knight engined model lists at $5,000, the "48" at $2,800, the "38" at $1,850, while the price of the "30" is $1,450.

In the Knight-engined model, the manufacturers have continued all of the features which in the first place served to attract attention and warrant the homage of intending purchasers, and in a number of noteworthy instances have supplemented them by others, which place the car on an even higher plane of excellence than in the past. For instance, there is the four-cylinder Kellogg air pump, which has been added and which contributes materially to the comfort of touring in that it permits a quick and easy method of inflating tires. The pump is mounted on an extension of the crankcase and driven by means of the water pump and magneto shaft, which, in turn, is driven from the crankshaft of the engine through the intermediary of a "silent" chain.

Another of the important additions to the already complete equipment which has been made is a complete dynamo electric lighting system. The system is the product of Gray & Davis, and the dynamo which forms its principal unit is mounted on an extension of the change gear housing; the drive in this case also is by means of a "silent" chain, this method having been chosen in preference to the belt drive by reason of its greater positiveness and the decreased liability to troubles caused by grease or oil coming in contact with the driving medium. The remainder of the system includes the usual storage battery and switches, and a complete complement of electric lights.



FOUR-CYLINDER 48-HORSEPOWER STODDARD-DAYTON AND THE KNIGHT "SIX" WITH WIRE WHEELS

The Knight motor itself—and, in fact, all the rest of the car—remains unchanged, with but two exceptions, which embrace the adoption of a new form of I-beam drop-forged front axle, which follows closely the design which has been perpetuated in Columbia cars, and a change in the steering gear, which now is of an improved worm

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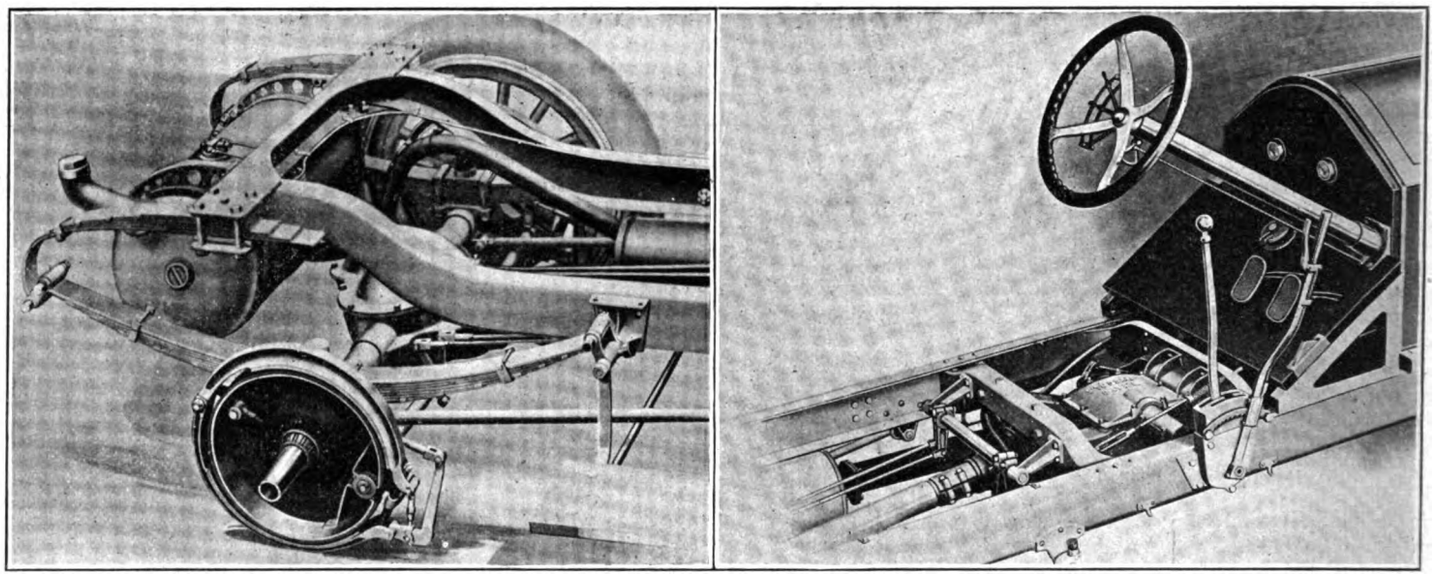
and sector type, in which the bearings all are of the roller type. Other changes of a minor nature include the adoption of a radiator of slightly greater capacity and the use of slightly larger wheel hub bearings.

The cylinders of the motor are cast in sets of threes, the valves, of course, being of the sliding type, which is the distinguishing mark of all Knight motors. The bore and stroke remain unchanged at 4½ inches and 5½ inches, respectively, the rated horsepower being 70. Another of the features of the engine which is almost as much a distinguishing mark as the valve system, is the method of lubrication. Below each connecting rod big end bearing there is a miniature trough, the six of them being mounted on a single rod, which extends the length of the crankcase. By means of suitable cranks and levers this rod is interconnected with the throttle lever in such a way that, as the throttle is opened, the troughs are brought into closer proximity to the connecting rods, the result being that the scoops with which the big end bearings are fitted dip deeper into the oil. This, of course, increases the supply of oil to the bearings, and also splashes a greater quantity on the cylinders and sleeves and auxiliary bearings. The troughs are maintained full to overflowing by means of a gear driven pump within the crankcase, the oil being screened during the process of circulation. Ignition is effected by means of a dual high tension system, the spark plugs being located in the center of the combustion heads.

Carburation is effected in a manner that is no less ingenious than the method employed to ensure efficient lubrication. The carburetter itself is located in the usual position, though the arrangement differs from others in that the air is taken in through a lengthy coreway in the crankcase casting. The result of thus causing the air to take its more or less tortuous passage before finally entering the carburetter is to cause a more homogeneous mixture, due to the fact that the air becomes preheated. Incidentally, much of the wheezing sound which usually emanates from the air intake pipe of carburetters is eliminated.

Of the other essential elements of the car, the large cone clutch with spring inserts and the three-speed selectively operated change gear mechanism are retained without alteration. The drive is by means of the orthodox propeller shaft through a set of bevel gears mounted on a full-floating rear axle. Both sets of brakes are located on the rear wheel hubs as in the past, the service set being internal expanding and the emergency set being external contracting. By way of supplying the demand, which even now is being felt and which it is expected will be felt much more strongly in the not far distant future, wire wheels are listed as optional equipment. Stock equipment includes wood artillery type wheels, which are shod with demountable quick-detachable rims carrying 36 x 5-inch tires both front and rear. The wheelbase of the car remains unchanged at 133 inches, though in line with the policy of the manufacturers bodies have been increased slightly in length in order to provide more legroom for passengers.

In essentials, the three poppet-valve engined chassis reveal no important changes either in design or construction. In the "48" the cylinders measure 4¾ x 5 inches; in the "38," which differs from the larger model in that a block casting is used, they measure 4⅛ x 5¼; and in the "30," which is of the same L-head construction as the next larger size, they measure 4 x 4½ inches. In each case the clutch is of the leather-faced cone variety, and the gearset provides three speeds forward and reverse, the control being selective by means of a side hand lever. These three cars differ from the Knight-engined model in that they are of the right hand steer variety, whereas in the latter the steering wheel is located at the left with the control levers in the center of the footboard.



REAR CONSTRUCTION AND CONTROL ELEMENTS OF STODDARD-DAYTON POPPET-VALVE MODELS

Two Books Dealing with Bearings.

On first thought it would seem almost impossible to fill even a few pages with matter on the subject of axles and bearings that would be of genuine interest to anyone except engineers and other technicians. That it is entirely possible to do even more, however, has been proved by the fact that the Timken Roller Bearing Co., of Canton, O., has brought out not one, but two, good-sized "Timken Primers" that are decidedly interesting, particularly to the non-technical reader. One of the booklets treats "On the Anatomy of Automobile Axles" and the other "On the Care and Character of Bearings." It goes without saying that the prime object of the primers is to call attention to the fine points of the Timken axles and bearings—a proceeding which, in the case of this concern's products, might be compared to the proverbial painting of the lily—but in addition they contain a great deal of information on axles, bearings and manufacturing processes in general, all told in language so simple as to be distinctly readable and readily comprehended by the veriest ignoramus in things of a mechanical or technical nature.

Franklin Adds a Six-Cylinder Runabout.

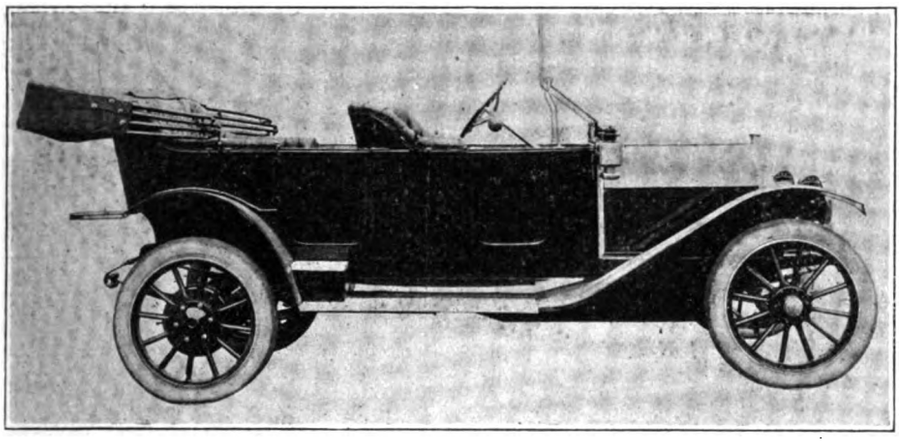
To round out its line, the Franklin Automobile Co., of Syracuse, N. Y., is bringing out a two-passenger runabout built on the Franklin "little six" chassis. The runabout will have a folding auxiliary seat in the rear which will accommodate two passengers. In body style it will be of the English type, with cowl dash and high side doors.

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SINGLE CHASSIS IN SCHACHT LINE

But It Mounts Two Body Styles—Left-Hand Drive, Long Stroke Motor and Electric Lighting Adopted.

Marking the entry of the Schacht Motor Car Co. of Cincinnati, O., into the ranks of those manufacturers who prefer to center their attention and productive activity upon a single chassis, the Schacht line henceforth will include but two models, a five-passenger touring car and a roadster, and both will be mounted on identical chassis. Incidentally, in contradistinction to all previous Schacht models, the new cars are of the left-hand steer and center-controlled variety, and will be marketed at prices which have been slightly advanced, in order to compensate for the liberal equipment which has been added.



SCHACHT 45-50-HORSEPOWER FIVE-PASSENGER TOURING CAR

As a matter of fact, the equipment which has been added, and which includes such evidences of up-to-date practice as a complete dynamo electric lighting system and a Prest-O-Starter, and the substitution of a new motor of the long-stroke type for the one which has been used in the past, constitutes the most notable alterations which have been made. As a matter of course, minor improvements have been made and corners here and there have been smoothed down, so to speak, though in the main the single chassis which serves for both models differs but little from its immediate predecessor.

In selecting the new motor, the necessity for accessibility and simplicity has not been lost sight of, and to this end the four cylinders are cast in single block with the valves all on the same side, where their enclosure to exclude dust and dirt and ensure the minimum of valve noises is comparatively simple; two light, removable plates serve to house the springs and tappets. The cylinder dimensions are 4¼ inches bore and 5½ inches stroke, which in comparison with the previous dimensions, which were 4½ x 5 inches, lends point to the assertion that the new motor truthfully belongs in the long stroke class; it is rated at 45-50 horsepower. As revealing the efforts which have been made to obtain the acme of accessibility, the exhaust pipe, instead of turning downward at the point where it attaches to cylinders, turns upward, thus permitting valve adjustments or replacements to be made with the greatest facility. Lubrication is effected entirely by force feed, a plunger pump in the crankcase forcing the oil by means of separate leads to all the main bearings and to the spiral timing gears. As an additional refinement, the oil filler plug has been located in proximity to the gauge glass, in order that the "smoke nuisance" may be abated by a judicious filling of the oil reservoir. Ignition is effected by means of a dual high tension system and a cellular radiator in combination with a centrifugal pump and fan ensures that the proper temperature of the motor is maintained at all times.

As was the case in the previous models, a large diameter cone clutch is employed to transmit the power from the engine to the road wheels, the intermediary being a selectively operated three-speed change gear mechanism which is mounted in the waist of the chassis. By way of still further increasing accessibility, the semi-floating rear axle which has been used in the past has been replaced by a full-floating axle in which it is a comparatively simple matter to withdraw the drive axles and the differential mechanism. As heretofore, two sets of brakes are provided, the service brakes, which are pedal operated, being of the external contracting variety, and the emergency brakes being internal expanding. The drums are 14 inches in diameter and afford a total braking surface of 350 square inches, which is more than ample for a medium weight car.

The wheelbase of both models is the same—120 inches—and remains unchanged, as does the spring suspension, which embraces semi-elliptic front and three-quarter elliptic rear members. Demountable rims form one of the items of added equipment; they are shod with 36 x 4-inch tires, both front and rear, in place of the 34 x 4 tires which have been used in the past. The equipment, as already has been mentioned, is complete, and includes, in addition to the Deaco electric lighting system and the Prest-O-Starter, a mohair top with slip cover, folding windshield (the feature of which is the incorporation of adjustable ventilators), speedometer, foot and robe rails, and the usual complement of tools, spares and so forth. In consideration of the better wearing qualities of nickel plate and the growing tendency to eliminate bright brass work, all metal trimmings are plated; the remainder of the paint-work is standard blue-black, though bodies may be finished in any color to suit the requirements of the individual purchaser. The five-passenger touring car, which is styled model "NS," lists at $1,775, and the second model "KL," which is the roadster, lists at $1,650.

Peculiarities of a Foreign Spark Plug.

The problem of preventing short-circuiting in spark plugs through carbon deposits on the insulating cores has been attacked in a novel way by the manufacturers of the Hobson-Pognon plug, a foreign production. Instead of endeavoring to prevent the carbon deposit, the inner end of the porcelain insulation is made so thin that it becomes very hot while the motor is working, with the result that the carbon is burned off and the insulation maintained. It is claimed there always is a clean area of porcelain, no matter how much carbon may be deposited.

Another of the features of this plug is that the sparking points overlap; the overlapping parts are not parallel, however, but at a slight angle, the result being that the spark has a tendency to assume a broad, fan-like form having high efficiency in igniting the mixture.

Imperial Also Takes Up the "Six."

Following the trend of the times, the Imperial Automobile Co., of Jackson, Mich., will include a six-cylinder, seven-passenger car in its 1913 line. The new model will mount a 60-horsepower enclosed valve engine, 4 x 5½ inches, and will have a wheelbase of 134 inches and tires 36 x 4½ inches. Its equipment will include an electric lighting and starting system. The price range of the Imperial line will be $1,250 to $2,500, and in addition to the six-cylinder car and the older four-cylinder models, the line will include a new two-passenger coupe and a five-passenger sedan. Center control and three-point suspension will remain features of all Imperial productions.

Six-Cylinder Stearns-Knight Coming.

Although it has not been wholly a secret, it has become public property that the F. B. Stearns Co., of Cleveland, will add a six-cylinder Stearns-Knight model to its 1913 line. The newcomer, however, will not be ready for delivery until about October 1st.

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RUSSIA'S TEST OF ARMY TRUCKS

American Vehicles More Than Hold Their Own in Competition With Europe's Best—Trial Lasted 17 Days.

In its effort to find the truck, or trucks, best adapted to the use of its army, for which an order aggregating 2,000 vehicles probably will be placed, the experiments conducted by the Russian government were of a most exhaustive character. They took the form of a 17-days reliability contest of an unusually difficult nature, which was in charge of General Dobrecshin. Forty-five vehicles presented themselves for the trial, which started from St. Petersburg on June 6th.

The flower of European motor vehicle production was represented by Mercedes, Benz, Napier, Saurer, Adler, Clement, Lancia, Berliet, Charron, Laurin, Buire, Vauxhall, and others. The American "White Squadron" was made up of two five-passenger 20 horsepower touring cars, two 30 horsepower field ambulances, using the regular White three-quarter ton capacity truck chassis, and one one-and-one-half ton capacity 30 horsepower truck, fitted with tank body for carrying the fuel supply for the tour.

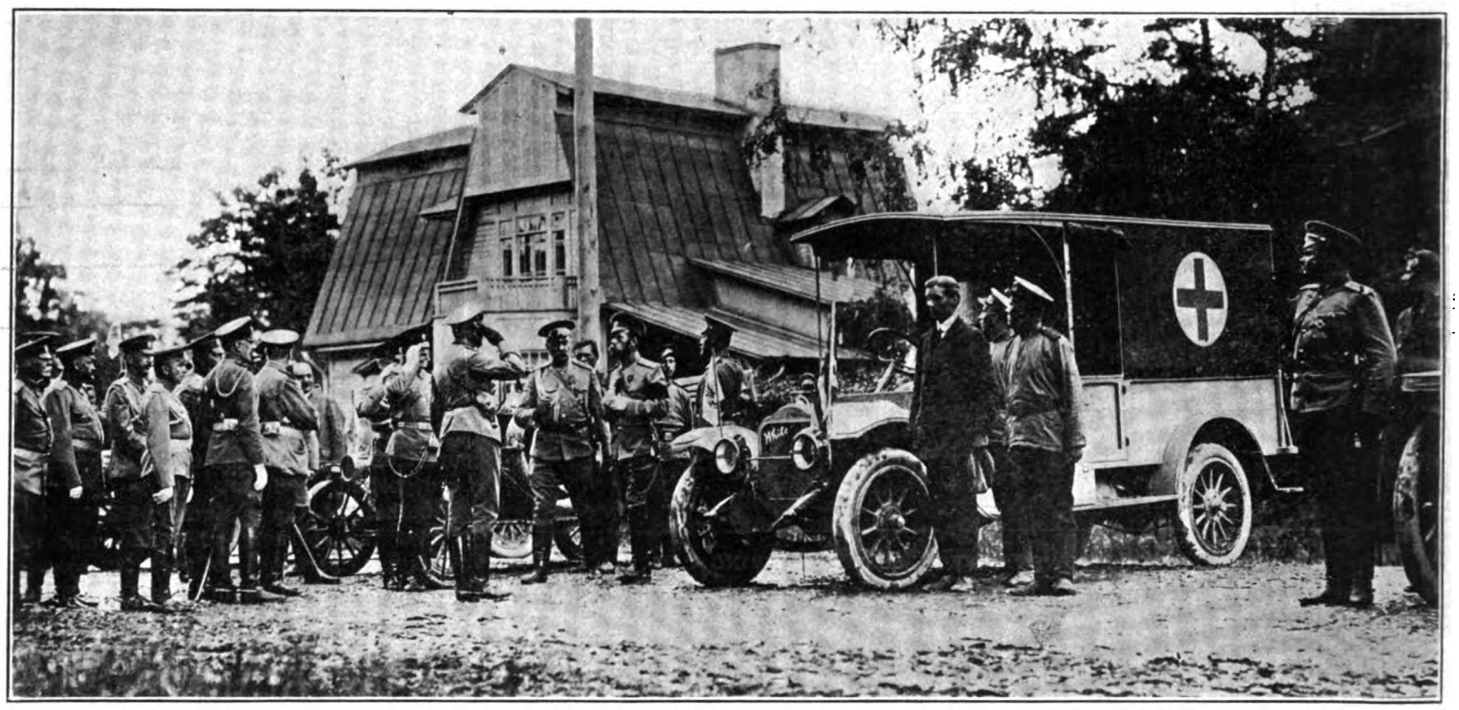
The route covered started at St. Petersburg, circled around through Moscow, and then returned over a different course to the Russian capital, the entire distance traversed amounting to about 1,960 English miles. The road conditions were indescribable. In many places there were no roads at all, the course being across sand hills, over fields and ploughed ground, and through forest trails. The best idea of the traveling conditions can be gained from the fact that it was necessary to precede the tour by a detachment of army bridge-builders in order to make it possible for the cars to get through at all.

The trials ended in St. Petersburg on June 23rd, after 17 days of the hardest service. The last three days' run was made at high speed over hard, rough roads, and was extremely exacting. Thirty-five cars finished the trip, among which were the five White contestants, with the record for a lower consumption of gasolene and oil than any of the European cars.

All five Whites went through the entire trip without mechanical trouble of any description, and created no little admiration among the Russian officials who supervised the trials. At the close of the run, all of the surviving contestants were assembled at Peterhoff, where they were personally inspected by the Czar of Russia, the Minister of War, and the high officials of the Russian army. The "White Squadron," on account of its fine performance, received a share of the Emperor's attention.

After the imperial inspection, all of the contesting cars were completely dismantled and every part was subjected to careful scrutiny for wear and deterioration. The commission of experts who conducted this examination reported that every one of the five White cars and trucks was in perfect condition. This report was followed by the report of the army officials that the White cars were suitable in every respect for the requirements of the Russian army service, and recommended that the entire five cars be purchased by the War Department. The next day the victorious "White Squadron" became the property of the Government of Russia.

The result of the trials and the subsequent action of the Russian Government is naturally very gratifying to the White Co., whose cars won out in the severe test against representative cars of Europe. While practically all the European cars were handled by factory experts, the White vehicles were taken care of by men from the London office of the White Co. and its agency in St. Petersburg, no factory representatives being present.



CZAR OF RUSSIA APPEARS ON THE SCENE TO CAST AN EYE ON THE WHITE VEHICLES

Hammers as Substitute for Wrench.

It sometimes happens that the large wrench necessary to remove a valve cap or hub cap is not available, notwithstanding the urgent necessity for unscrewing the part. In such an emergency, the work often can be done by holding one hammer or some other heavy piece of metal against one of the faces formed for the wrench and striking the diametrically opposite face with another hammer. The weight should be held near the corner that will be leading when unscrewing, and the hammer applied near the leading angle on the opposite facet. If the cap or nut is tight it will start very much more easily in this way than if the hammer alone is used. Obviously, if the hammer is not handled carefully, so that its face strikes flat on the face of the cap, more or less marring of the surface will occur. If the surface is a finished one it should be protected by a piece of sheet brass or copper or even hardwood. This method of removal as an emergency measure should should be resorted to with care.

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UNCOVERING THE "NOISE" IN THE MECHANICAL HORN

Ingenuity and Variety of Design Disclosed by Baring Internals of Modern Signaling Devices Built Around Drumhead Principle—The Three Types and the Differences That Distinguish Them One From the Other—Diaphragms That Vibrate 30,000 Times a Minute.

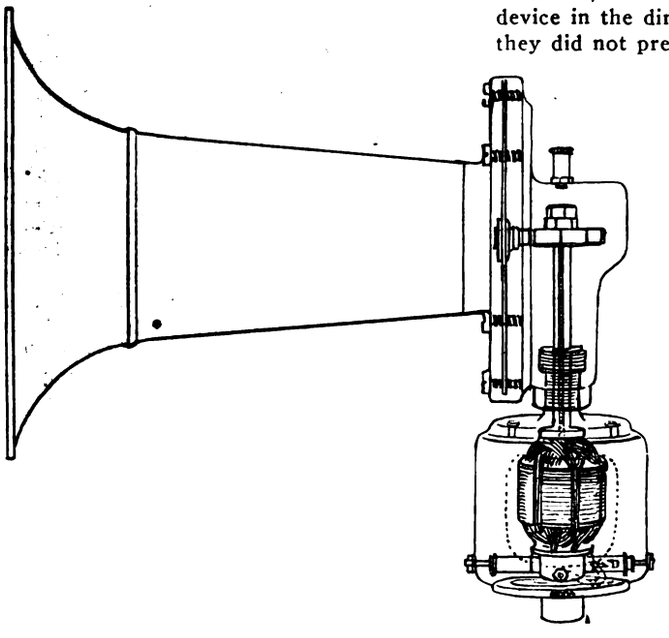
During the first few years of motor car development, when an automobile "announced" its approach by noises that were audible long before the vehicle hove in sight, little or nothing was heard of the necessity of equipping motor vehicles with a really effective warning signal. Probably their designers were too absorbed in the task of eliminating the noises that vied with those which any signaling device could produce.

Necessity, however, is the mother of invention, and as careful designing and better constructional methods and facilities gradually eliminated noise center after noise center, and study and care reduced the sounds which it seemed impossible to silence, cars of the self-announcing variety gradually disappeared, and something in the way of a warning producer became more or less a necessity. Bells and gongs, which have reigned supreme as warning signals in the cycling world never found much favor with those who had to do with motor cars; probably for the reason that the tone of such devices was not sufficiently distinctive from the sharp metallic clinks and clanks which accompanied the operation of early automobile motors to be easily recognizable as a warning signal. At any rate, the bulb horn, with its brass or bronze reed set in vibratory motion by the action of a column of air forced by the action of a rubber bulb and which set up a distinctive grunt which neither was musical nor entirely displeasing to the sense of hearing, found instant favor, and became the standard warning device.

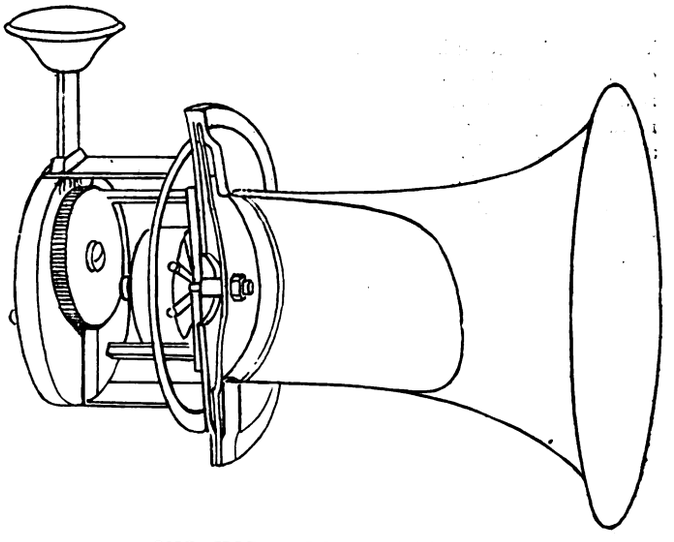
The inherent effects of the bulb horn—the inability of the bulb to "stand up" for any considerable period, the disposition of the reed to be affected by water and dust, the possibilities, in no wise remote, of the connecting tube developing a leak, the failure to project the sound to considerable distances, and a general inaudibility of the device in the din of street traffic—although they did not prevent nor limit the development and application of the bulb horn, they did lead to the production of other warning apparatus of various types which are more rugged and, at the same time, more efficient as sound producers. It is not at all unlikely that, had four and six cylinder motors attained the ascendency at an earlier period or had efficient storage batteries been used instead of dry batteries for ignition services, either the exhaust horn or the electric type of signaling device quickly would have found favor. With all its defects, however, the older type of signaling device still persists, and not a few of its staying qualities are derived by virtue of the adaptability of the horn to meet any and all conditions—that is, simply by varying the speed with which the bulb is collapsed, the volume of sound from the horn can be controlled and fitted to the needs or conditions. This also is true of the exhaust horn, and of the electric devices in some cases, but as a rule with the electric horn the volume and tone of the device cannot be varied.

Signaling devices other than bulb horns, which for want of a better term may be styled mechanical signaling devices, since in each of them either gear wheels, cranks or levers or some other well known mechanical devices are used either for the actual production of the sound or for its control, can be classified under three general heads: those which are operated by electricity, those which are manually operated, and those which are operated by the exhaust of the motor. Devices of the first class are by far the most numerous.

Although those who have to do with motor cars can, in nine out of ten cases, differentiate between the different classes of signaling appliances by either the quantity or the quality of sound issuing from the devices, few are sufficiently familiar with the works of the mechanical devices to be able to say really just what produces the sound. Unlike the drum which, when the head was punctured by the curious small boy who desired to see where the noise originated, revealed nothing but emptiness, to the consternation of the lad, the mechanical horn reveals not only not a few component parts which have to do with the production of the sound, but more ingenuity and variety in their design and arrangement than is generally supposed is the case.



KLAXON RIGHT ANGLED CONSTRUCTION



LONG HORN "ROLLER-TOOTH" CAM

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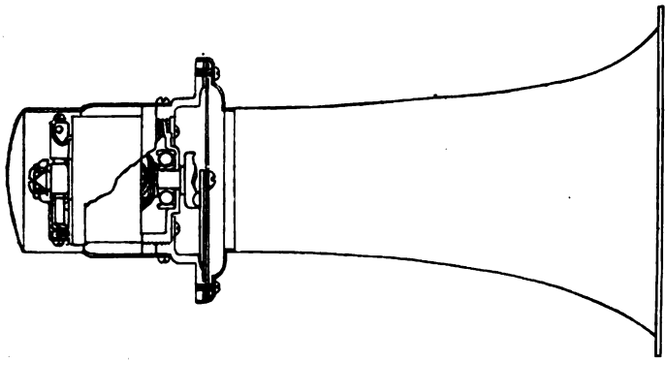
With the electric horn, for example, the noise generally is produced by the more or less rapid vibration of a metallic diaphragm placed across the mouth of the megaphone or projector. Practice with regard to the operating mechanism which imparts the desired motion to the diaphragm, however, differs widely. There are those who, like the makers of the Klaxon and Newtone, install a small motor to impart the desired movement and sound, while others—among them the producers of such horns as the Tuto and Mesco—pin their faith to a series of electro-magnets and an armature which is attracted by current in the magnets and retracted by the action of a spring during alternate intervals.

With the motor driven type of diaphragm horn, the rotary motion of the armature shaft is converted into reciprocating or vibratory motion through the intermediary of a cam wheel attached to the revolving shaft, the teeth of which act upon a shoe or anvil positioned either directly on the diaphragm or on a lever which comes in contact with the diaphragm, according to the ideas of the designer.

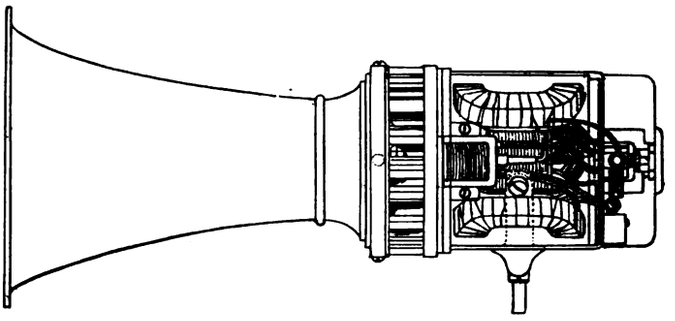
The Klaxon, produced by the Lovell-McConnell Mfg. Co., Newark, N. J., and which set the fashion for mechanical horns, is distinctive from other electric signaling devices of the same type in that the motor shaft is parallel with the plane of the diaphragm, whereas in all others the shaft is normal to the diaphragm. The diaphragm is a flat piece of heat-treated vanadium steel, 5½ inches in diameter, supported between cork gaskets in a housing formed by the base of the projector and the casing which houses the cam or ratchet wheel. The motor, which is provided with laminated field pieces and laminated drum wound armature, is housed in a separate casing below the rear portion of the projector. Brushes are made of tightly compressed copper netting and the interstices filled with a suitable lubricant to reduce friction and yet not cause sparking, as would be the case were the brushes lubricated with oil. The armature shaft revolves on ball bearings at a speed of 3,000 revolutions a minute, so that the anvil on the diaphragm is struck 30,000 times a minute, there being ten teeth cut on the periphery of the cam wheel. Freedom from wear of the cam wheel and the anvil, which are the parts which work under the most trying conditions, is insured not only by the quality of steel which enters into the construction but also by the ample lubricating facilities provided by the oil hole, which is positioned in the top of the cam wheel casing. The terminals of the Klaxon are carried through to the outside of the motor casing, so that the cables can be attached and detached without the removal of covers.

Radically different features appear in the design of the Typhoon, made by the Typhoon Signal Co., Chicago. In common with the Klaxon, separate casings house the motor and the ratchet wheel, which, however, is stationary and is fastened to the plate which separates the two casings. The armature shaft, which is carried through the separating wall through a plain bearing, carries a disk or face plate provided with two lugs in line, to which is pivoted a dog. The dog is in the shape of a bell crank and the pivot passes through the angle so that the longer leg of the dog comes in contact with the teeth of the ratchet wheel, while the shorter leg, which is slightly weighted on the end so that a head is formed, is free to "tap" the vanadium steel diaphragm. For each revolution of the armature shaft there are 24 taps, so that when the motor is revolving at full swing—3,000 revolutions a minute—a tone neither distinctly musical nor yet so harsh and metallic as to be entirely displeasing is emitted by the rapidly vibrating diaphragm. Owing to the fact that the diaphragm is not weakened by being pierced, as is the case when the anvil is placed on the diaphragm, it is claimed that the latter is not so liable to crack, and this freedom from breakage, too, is made more certain by the small distance through which the center of the diaphragm vibrates. The motor of the Typhoon is provided with laminated field pieces and armature, and is snugly enclosed in a protecting housing. Lubrication is provided for by means of ducts which carry the oil to the plain bearings of the armature shaft and which can be closed by screw plugs.

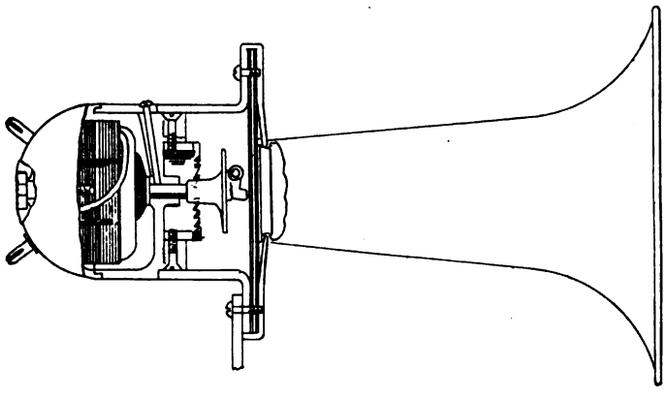
But six teeth are provided on the cam wheel of the Newtone horn, which is made in Brooklyn, N. Y., by the Automobile Sup-



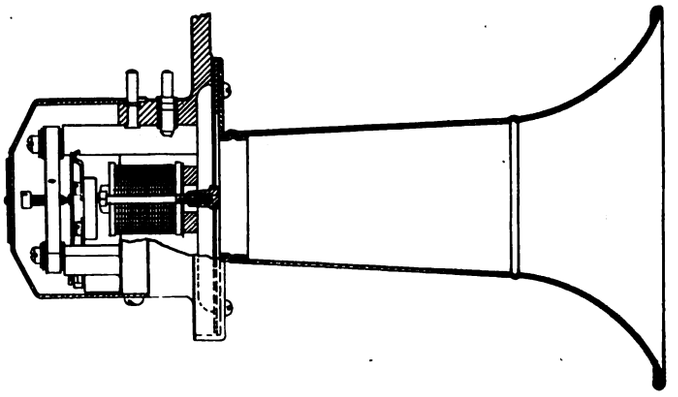
NEWTONE MOTOR-DRIVEN DIAPHRAGM HORN



OPERATING MECHANISM OF THE SIRENO



TYPHOON STATIONARY CAM MECHANISM



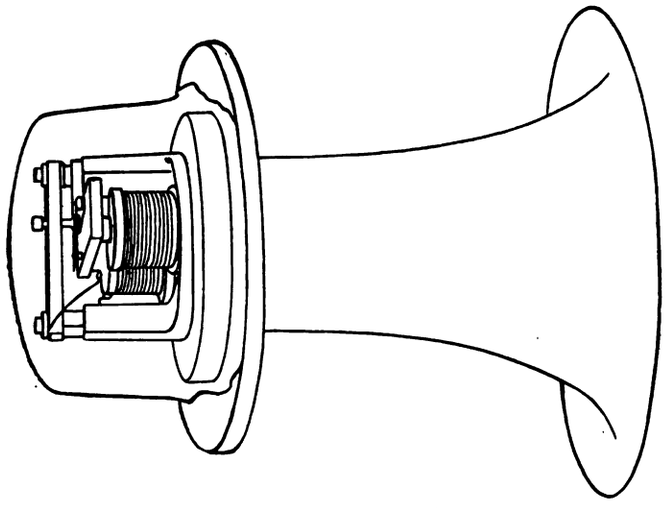
INTERNAL ARRANGEMENT OF THE TUTO

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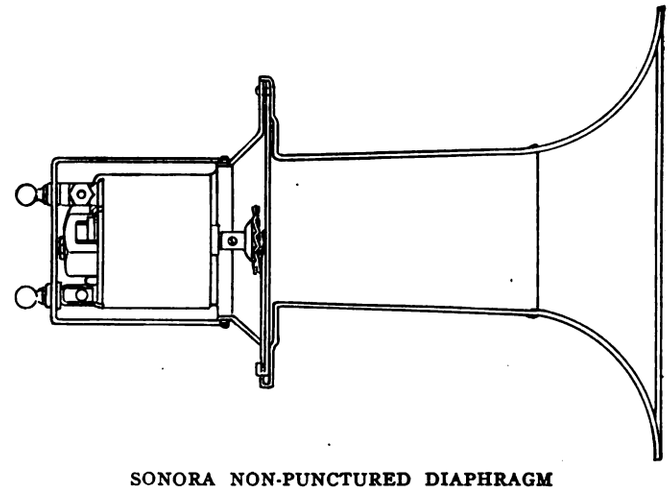
ply Manufacturing Co., and the drops between the teeth are shallow. The angles on the face of the cam are very much modified, which, in conjunction with the shallowness of the drops, makes for easy and consequently quick starting of the motor, with the result that the maximum noise can be produced in a very short interval. The limited height of the teeth, however, does not interfere in the least with the magnitude of the vibration of the diaphragm, for this is increased over the height of the teeth through the agency of a small lever to which the anvil is attached and which serves to transmit the motion to the diaphragm. Freedom of movement of the armature shaft is insured by the Hess-Bright ball bearings on which it is mounted, while the self-lubricating brushes also tend to eliminate friction. The motor, which is built after the best modern practice, with laminated field pieces and armature, is entirely self-contained and can be removed from the rest of the apparatus simply by loosening a lock nut and unscrewing the motor from the rear half of the casing which houses the diaphragm. In the same manner adjustment for wear either of the cam wheel or of the anvil can be made, save that in this case the motor is screwed further into the casing, which brings the cam wheel closer to the anvil. The method of conducting the current from the terminals, which are positioned outside of the case close to the diaphragm, is unique. From the inside of the terminals two brass brushes lead to two concentric brass rings which are mounted on a fibre plate, which in turn is mounted on the front of the motor casing. The rings are connected with the leads which conduct the current through the motor. When the motor casing is revolved the brushes rub on the surface of the conducting rings, so that contact is effected, no matter what the position of the motor happens to be. The horn can be taken apart without the risk of breaking connecting wires through this arrangement. Like the Klaxon, Newtone practice embraces the use of a 5½-inch vanadium steel diaphragm which is held between cork gaskets.

Like the Newtone, the Sonora employs a lever to transmit motion to the diaphragm and to amplify the distance through which the diaphragm vibrates over the depth of the teeth in the cam wheel, but the arrangement differs slightly from Newtone practice in that the lever is not fastened to the diaphragm, but taps it in a manner similar to that of the dog in the Typhoon signal. Owing to the comparatively light parts which are moved by the motor, the latter is small, consuming, it is claimed, but 2¾ amperes. The cam wheel, which is made of pressed sheet metal and consequently is very light, is provided with 10 teeth which impart 30,000 blows to the diaphragm every minute. A self-contained motor with plain bearings, which is amply protected from dust by a casing, is one of the features of the design. The Sonora is made by the Sonora Motor Horn Co., of New York City.

Radically different from either of the motor driven horns already described is the Sireno, product of the Sireno Co., New York City, and which, as its name implies, embraces the use of a siren to produce the warning signal. The instrument, however, does not produce a sound which fluctuates in pitch within wide limits as the speed of rotation of the rotor increases and decreases, that is, the fluctuations occupy such a short interval of time that they are not noticeable. The rotor of the horn is made of cast aluminum, carefully machined and mounted directly on the armature shaft. The light weight, which means small inertia to retard the starting speed of the device, and the reduced friction of the shaft bearings owing to the use of ball bearings, enable the motor to attain its highest speed within a very few seconds, while the action of a magnetic brake, which is brought to bear against the rotor directly the current is broken at the switch, retards the motion of the shaft and appurtenances in an equally short space of time. The motor is of the drum wound type with laminated armature and cast steel field pieces, and is housed in a tight casing behind the rotor. The employment of ball bearings and the entire absence of other frictional surfaces save the brushes, which are self lubricating, preclude the necessity of oiling the device. The rotor, which, in conjunction with a series of slots that are cut in the circumference of that part of the housing which serves to cover the device, produces the noise, is nothing more nor less than a centrifugal fan, that is, a fan which, owing to the speed with which it is rotated, throws the air, which is admitted to the base of several radial passages at the hub of the wheel, out at the periphery, where the passages terminate. The air thus thrown off passes through the slots in the housing, and the more or less weird sound is produced, the tone and the pitch varying according to the number of "puffs" which are created during a given interval of time. With the Sireno the air is admitted to the passages at the hub of the rotor through the intermediary of the projector or bell of the horn.



HIPWELL AUTOPHONE CONSTRUCTION



SONORA NON-PUNCTURED DIAPHRAGM

Of the electric diaphragm horns in which the "buzzer" action is incorporated, probably none is better known than the Tuto, made by the Dean Electric Co., Elyria, Ohio. The name is not idly chosen and is intended to convey the meaning that two separate and distinct sounds, or in reality two different degrees or volumes of the same sound can be produced at the will of the operator. The internal mechanism of the Tuto, analyzed, reveals nothing more complicated than the action which is enclosed within an ordinary trembler bell. An armature made of soft iron, so that it will not become permanently magnetized, is placed a short distance from the pole pieces of a couple of electro magnets, and is held "hinged" in this position by means of a piece of spring steel. Naturally any current which passes through the magnets causes the latter to attract the armature against the action of the spring. When the flow of current is interrupted the

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OFFERS MORE CAR FOR LESS MONEY

Great Western Finds Ways of Attaining that End—New Model Marked by More Power and Full Equipment.

Despite the fact that the revised edition of the Great Western car, which is designed to take the place of the cars that have been marketed under the same name in the past and to continue the renown of the Great Western Automobile Co., of Peru, Ind., is a bigger car throughout than ever before with a brand new motor of greater horsepower, and a more completely equipped car, its price has been fixed at $1,585, which represents a reduction of just $265. The reduction, it is explained, is made possible by reason of a material increase in output which will be made, though it should be apparent to the average individual that though a saving has been effected in this way and also because of greater shop efficiency a considerable portion of the abbreviated "overhead" has been turned right back into the cars in the form of extra equipment, more careful workmanship and more impressive finish.

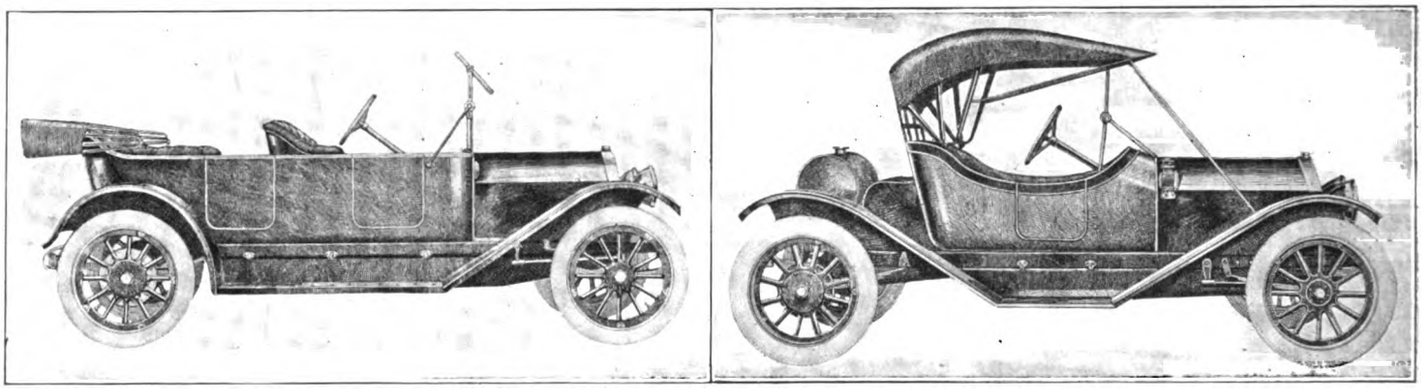
As heretofore, the line is built upon a single chassis and includes four- and five-passenger touring bodies, a roadster and a four-passenger fully enclosed car that not inaptly has been styled a "Sedan." In keeping with the more luxurious character and fittings of the Sedan, its price has been set at $2,250. As already has been mentioned, the equipment is complete in the real meaning of the word, and includes a silk-mohair top with Fairfield rubber dust cover, rain-vision ventilating windshield, Stewart speedometer, Solar electric head, side and tail lamps, Typhoon electric signal, gasolene gauge, demountable rims with an extra rim, tire irons, tool box, tools and spares.

The most important change which has been made concerns the motor, of course. Following out the policy of the manufacturers, who always have inclined to the use of long stroke engines, the new power plant has its four cylinders cast separately, the bore and stroke being 4¼ inches and 5½ inches, respectively. The valves are large and their position all on the same side facilitates the use of a single light dust-proof cover, which renders the valve action as quiet as it is possible to make it. One of the excellent features of the engine which has as its laudable purpose the prevention of carbon deposits collecting to cause trouble, is that the piston heads are convex. Incidentally, the construction materially strengthens the parts which are made as light as possible in order to reduce the strain caused by high rates of reciprocation. Another new feature is the location of an oil groove in the pistons below the wrist pin. The groove is drilled at several points to permit excess oil to drain back into the crank chamber and thus prevent smoking.

Lubrication is effected mainly by splash with auxiliary oil leads to the main bearings and to the spiral timing gears which are contained within the crankcase. The oil is maintained in constant circulation by means of a positively driven plunger pump of adequate capacity. Cooling is by pump circulated water and the mixture is fired by a high tension Remy magneto. Power is transmitted from the engine to the rear wheels through the intermediary of a large, leather-faced cone clutch and a three-speed selectively operated change gear mechanism in which the through shaft and the lay shaft are located side by side. Thus, all the gears receive the same lubrication and are equally accessible for inspection when the gear case cover is removed. The differential is contained in a pressed steel housing which is equipped with an extra large inspection plate and the rear axle is of the full-floating type.

By way of providing "soft" riding, the springs have been increased slightly in length, the front semi-elliptic members measuring 40 inches in length and the rear members, which are of the three-quarter elliptical variety, measuring 47 inches in length. For the same reason and also to increase the desirable quality which best is explained by the term "roadability," the wheelbase has been lengthened to 118 inches. Despite the longer wheelbase, however, the shape of the frame and the arrangement of the steering connections is such that the car can be turned quite easily in a fairly narrow street.

Great Western bodies are a combination of steel and wood, and great pride is taken in the fact that in the finishing process no less than 18 operations are necessary. Giving evidence of the roominess of the seats, the rear compartment in the five-passenger touring car measures 49 inches in width. Throughout the cars, attention has been centered on efforts to increase the comfort of passengers, one little instance being the location of a good sized pocket for goggles and memoranda between the two front seats. Smoothness of appearance also has claimed attention, and to this end door hinges and latches have been removed to the comparative obscurity of the inside and there are no outside projections or protuberances to be knocked and deformed by passing vehicles.



GREAT WESTERN "40" TOURING CAR AND ROADSTER—BOTH OF WHICH LIST AT $1,585

To Make Blue Prints Black and White.

Although it seldom becomes necessary to make additional prints from a blue print, it is possible to do so provided the original print first is converted into one in which the lines are black and the background white. The operation to change the color is neither difficult nor does it require a great amount of time. It is merely necessary that the print be immersed in a solution formed of ¼ ounce of ordinary borax dissolved in 6 ounces of cold water. When the print has blackened, it should be removed and washed thoroughly and placed in a solution composed of ¼ ounce of gallic acid, ¼ ounce of tannic acid and 8 ounces of cold water. This will intensify the color and make the print permanent.

Low Tank That May Cauce Backfiring.

If the motor shows a tendency to fire back through the carburetter when ascending a grade, it is well to make sure that the gasolene tank is high enough properly to supply the carburetter before looking elsewhere for the trouble. If the tank is only very slightly too low, the back firing will occur only on severe grades.

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CHALMERS CARS IN 14 BODY STYLES

Standardization That Has Affected "Six's" Price—Three Chassis and a New Air Starting System.

Although the merits of standardization have been extolled and its praises have been sung, it is seldom that more concrete evidence of its advantages is given than is afforded by the action of the Chalmers Motor Co. of Detroit, Mich., which, by reason of the adoption of such advanced practices, has found it possible to reduce the list price of its six-cylinder model from $3,250 to $2,300. In explanation of the $950 cut in price that has been made, it is pointed out that, though the standardization of many of the parts which go to make up both the "six" and the four-cylinder model which is styled the "36" has had a very material effect on the cost of production, no inconsiderable portion of the reduction can be traced directly to the increased manufacturing facilities which in the past year have been effected.

Despite the very noticeable reduction in price, however, the car itself is just as big as ever; in fact, it scarcely has been changed at all, except that it has been made even more attractive by careful refinement and the addition of a complete dynamo electric lighting system to the already well-filled equipment list. The other cars in the line—the "30" and the "36," both of which are four-cylinder models—have suffered practically no alteration, the "30" being continued in the same form in which it was introduced some five years ago and at the same price, namely, $1,500; the "36" still lists at $1,850, at which price it made its initial appearance last year, just prior to the launching of the "six."

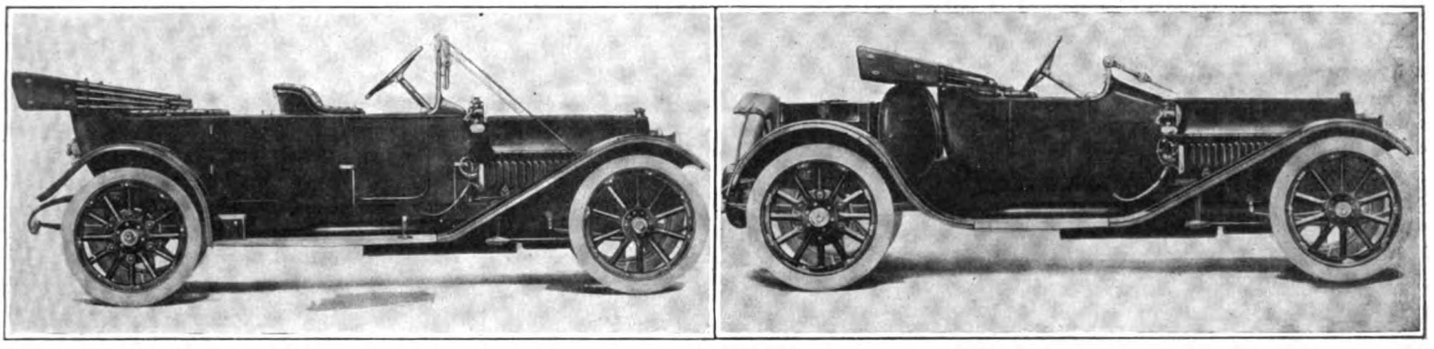
Although it is not always possible to accept the statement "practically no alterations have been made" in its literal sense, it is quite possible to do so in the case of the Chalmers line. Such changes in mechanical construction as have been made can be counted on the fingers of one hand. By far the most noticeable changes are apparent in the construction and appointment of the bodies, which under the hands of skilled designers have been developed to the point where the intending purchaser scarcely can find anything to desire either from an esthetic point of view or from the more material point of view of the passenger. The cowls of all the models have been made deeper and serve to mount the usual dash accouterments, such as the oil and air pressure gauges, the speedometer and the ignition and lighting switches. The upholstery has been increased in depth from 10 to 11 inches, and by reason of its luxurious character and the absence of the usual tufting, which has been replaced by softly folded leather, has been styled "Turkish cushioning."

The bodies themselves are of entirely new design, in which pains have been taken to ensure harmoniousness between the lines of the doors and sides and the engine hood and cowl. To this end, the mouldings have been made exceedingly fine and all external protuberances have been relegated to less conspicuous places inside. One of the distinctive features of the design, which is carried out in substantially the same manner in all the models, is the absence of the usual filler-board between the windshield and cowl. Instead of being mounted on a board, the windshield is formed to fit the cowl, to which it is attached directly.

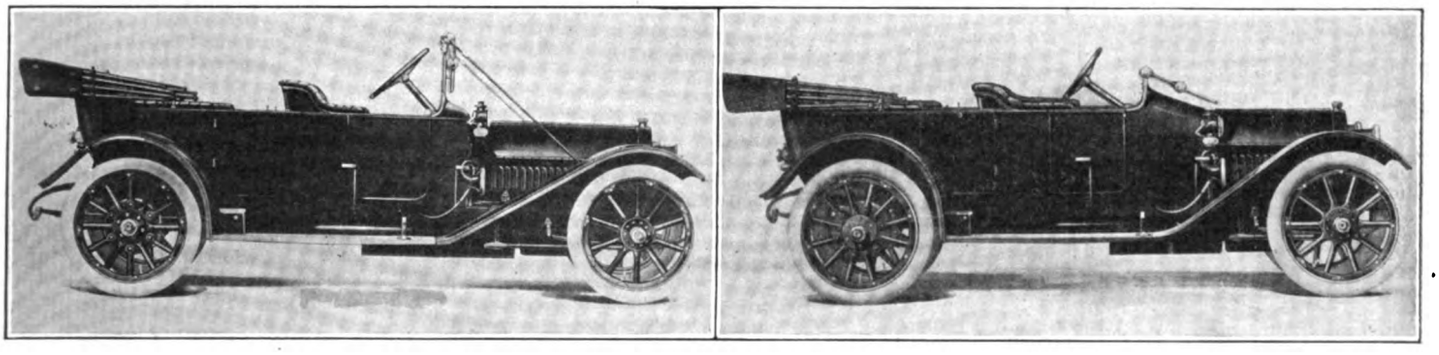
Regarding the mechanical construction of the three cars in the line, the only alteration which can be viewed in the light of a real change from previous practice concerns the driving axles. The axles themselves all are of the full-floating type, and in place of the crab drive to the wheels, which has been used in the past, a flange which fastens to the rear wheels by means of six bolts is used. The reason for the change, it is explained, is to eliminate the possibility of lost motion at this point.

Such other mechanical changes as have been made really are more in the nature of additions to equipment. Thus, for instance, though the distinctive Chalmers air engine starting is retained, the method of obtaining the necessary air pressure in the reservoir has been altered and now is effected by means of a four-cylinder Kellogg air compressor, which is connected to the pump shaft of the engine through the intermediary of a "silent" chain. Under the old regime, pressure was obtained by means of a check-valve inserted in one of the engine cylinders. The addition of the air pump makes possible the inflation of tires with pure air instead of with compressed burned gas, as was the case last year.

The other noteworthy addition to equip-



CHALMERS "SIX," WHICH LISTS AT $2,300 IN TOURING AND ROADSTER FORMS



TWO BODY STYLES MOUNTED ON CHALMERS "36" CHASSIS—TOURING AND TORPEDO

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ment which has been made and which scarcely can be listed as a change in construction, is to be found in the electric lighting system, which is of Gray & Davis manufacture. The dynamo is mounted on a bracket at the forward end of the engine and is driven by means of a V-belt, which serves also to drive the fan. The remainder of the system embraces the usual automatic cut-out for disconnecting the battery from the dynamo when the engine is idle, a storage battery of liberal capacity, and a complete complement of electric side, head, tail and dash lamps.

In the essential elements of the cars—namely, the motors, the clutches, the change gear mechanism and the running gears in general—no room for improvement has been found, and these parts are continued along the well tried out lines that were established when the cars first were placed on the market. The distinctive valve arrangement with the intake valves overhead operated by rocker arms and the exhaust valves at the side, is retained in all the models, the cylinders in the case of the "fours" being cast in single blocks and in the "six" in sets of three. Similarly cylinder dimensions have not been changed and remain 4 x 4½ for the "30," and 4¼ x 5½ in both the "36" and the six-cylinder model, which rates at 54 horsepower.

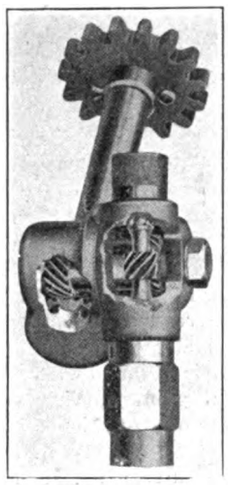
Ignition in each case is effected by means of a dual system using a single set of spark plugs. The constant level splash lubrication system is used in all the engines, the crankcase compartments being maintained at the proper level by means of a gear pump and the operation of the system being rendered visible through a sight feed glass located on the dash. In the smaller four-cylinder model, the three-speed change gear mechanism which has been used from the first is retained, the two larger cars being equipped with four-speed gearsets and all of them being selectively operated by right-hand levers.

Clutches all are of the multiple disk variety and operate in oil baths. Another slight change which has been made concerns the steering gear, which is larger and is fully enclosed in order to protect the parts from dust and dirt. The same column now is used on all the models, this feature being possible by reason of its construction, which permits of its adjustment over wide limits to suit the various bodies on the three chassis.

On the smaller four-cylinder model and the "six" the wheelbase remains the same —115 and 130 inches, respectively—though in the "36" it has been increased from 115 to 118 inches. Springs in each case are semi-elliptic in front and three-quarter elliptic in the rear. On the three chassis which go to make up the line no less than 14 types of body are supplied, the list including four-, five- and seven-passenger touring cars, roadster, inside driven coupe and limousine, prices in each case including as complete equipment as is necessary to suit the duty for which the car is intended. Demountable rims, top with dust cover, windshield, and electric lights are included in the equipment, which in the case of the "36" and the "six" also embraces the air engine starter.

Evolves Worm-Drive for Speedometers.

It may sound rather paradoxical, but nevertheless it is true that not a few speedometer troubles originate elsewhere than in the speedometer, and that while the instrument may be capable of performing its functions satisfactorily, it does not always do so. To be more explicit, irregularity of operation, unsteadiness of the indicating needle and even partial or total interruption of the function of indicating speed not infrequently are caused by imperfections in the mechanism through



RELIANCE SPIRAL DRIVE

which motion is transmitted from one of the road wheels to the speedometer, with the result that a speedometer that in itself is accurate and reliable may be regarded with suspicion, if not entirely discredited. A realization of this state of affairs has led the Reliance Speedometer Co., of 134 Eliot street, Boston, Mass., to develop the driving system shown in the accompanying illustration; so far as known it is the first spiral or worm transmission of the sort that has been evolved.

The most notable feature of the drive is the employment of spiral gears for transmitting motion from the short shaft carrying the driving pinion meshing with the gear on the road wheel to the flexible shaft which drives the instrument itself, and the elimination of friction and excessive wear by the use of ball bearings. The spiral gears and ball bearings, of course, are enclosed in a dust-proof casing, and lubrication is supplied by means of a grease cup of liberal size; there is a swivel joint which makes it possible to set the driving and driven shafts at any desired relative angle when installing the instrument. A feature that has obvious practical advantages is the ease with which the driving pinion can be removed and replaced with a new one. This pinion works under the most trying conditions, exposed to grit and mud, to say nothing of accidental damage from flying stones and the like, and quite naturally it is subjected to considerable wear. In the case of the Reliance mechanism, this pinion can be removed by withdrawing an ordinary split-pin and a new pinion attached by the reversal of this proceeding.

Throttle Opening that Prevents Choking.

As a "stunt" and for the purpose of testing carburetter adjustment, the sudden wide opening of the throttle is all well and good, and if the motor responds instantly without coughing or choking it speaks well for the operation and adjustment of the carburetter. But in actual road work it will be found that in nearly all cases the motor will pick up more rapidly and with better power if the throttle is opened gradually — not necessarily very slowly, but steadily and evenly. A little experimenting will indicate just how rapidly the valve can be opened, and this knowledge may be of the greatest value should the driver find himself in a position where the car must be accelerated with maximum rapidity. In such a case the impulse to throw the throttle lever to the end of its travel is strong, but it should be tempered with judgment and the carburetter given a chance to do its work properly.

Prisoner Devises a "Crook Catcher."

The old adage about setting a thief to catch a thief may not apply in all cases, but Lawrence T. Romer, an automobile mechanician who is serving a term in the Denver (Col.) county jail, unknowingly, perhaps, has lent color to the proverb by devising a scheme whereby the thieving "joy rider" may be thwarted before he even gets started on his trip. Romer proposes to attach his device, which may be set when the car is stopped and which will emit siren-like calls for help as soon as the would-be thief attempts to crank the car, the sound coming from an adaptation of a siren whistle located beneath the hood. The racket is calculated to be sufficient not only to cause terror to the thief but to attract attention to his contemplated deed. The arrangement will work as well in a garage at night as on the street.

Concerning Adjustability of Bearings.

Ball bearings and roller bearings in which no adjustment for wear is possible are so commonly used in motor car work that sometimes the fact is lost sight of that there are adjustable bearings of both classes. Adjustable roller bearings have tapered races and correspondingly tapered rollers, so that by moving the inner race ring further into the outer ring the surfaces upon which the rollers run are brought closer together, and so wear is taken up. The principle upon which ball bearings are adjusted is the same, and is exemplified by the old familiar bicycle bearings.

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FARM TRACTORS SUBJECTED TO PRACTICAL TESTS

Annual Trials at Winnipeg Indicate the Decline of Steam and Ascendency of Gas Machines—Also Prove Tractor Design Almost Uninfluenced by Past Experience of Motor Car Engineers—How the Tests Were Conducted and the Many Awards That Were Made.

Prize winners were the rule instead of the exception at the Agricultural Motor Competition held in connection with the Canadian Industrial Exhibition at Winnipeg during the two weeks ending July 20th. Three prizes, consisting of gold, silver and bronze medals appropriately engraved, were offered in each one of the seven classes, and there were so many classes and so few entries in each class that those engines which came away without any of the jingling ornaments for souvenirs must have felt lonesome indeed.

The competition, of which the one just concluded is the fifth, is held annually under the auspices of the Exhibition Association during the Winnipeg Fair, and though ostensibly started to furnish the big wheat farmers of Western Canada with a basis on which to compare the performance of different makes and types of tractors. it has degenerated of late years into more or less of an advertising stunt for the tractor manufacturers. Hence the greater number of prizes and prize winners.

One thing the contest has shown, however, and that is the ever increasing superiority and popularity of the internal combustion engine as a source of farm power. In the first two contests the steam engines were in the majority and made by far the best showing in regard to fuel consumption and steady running. In 1910 the number of gasolene engines had exceeded the number of steam engines entered, and also succeeded in coming away with the most coveted prizes. In the last two years there has been another change, for both last year and this year the premier honors have gone to the engines using kerosene for fuel, and it looks as though they are now so far ahead in the matter of efficiency that there is no hope of the other types ever catching up again. As a matter of fact, one of the chief features of the 1912 contest was the number of internal combustion engines entered in both gasolene and kerosene classes, the same machine, in many cases, being adjusted to handle both kinds of fuel.

The official results of the tests, which have just been made public, though the contest has been concluded for over a week, show that the kerosene engines have come to the front again in this year's contest, with the gasolene motors showing the second best performance and the big steamers away at the foot of the class. According to the official data sheet, the Rumely "Oil Pull" kerosene tractor made the best showing in the various tests and lead the field with a score of 449.75 points out of a possible 500. An Aultman-Taylor gasolene engine was next, with a score of 447.7, and the best mark for a steam driven tractor was that made by the J. I. Case entry No. 27, which scored 442.85 points. These figures, of course, are entirely irrespective of classification, according to horsepower.

The complete tests of the competing engines were made in four separate divisions, designated as Economy Brake Test, Maximum Brake Test, Plowing Test, and Design and Construction.



AULTMAN-TAYLOR, A PRIZE WINNER

The economy brake test consisted in running the engines belted up to a Prony brake dynamometer for a period of two hours at their normal loads, while careful measurements were taken of the power output, fuel, oil and water consumption, steadiness of running, etc. For this test a total award of 190 points was possible, divided as follows:

	Internal Combustion.	Steam.
H. P. hours per unit of fuel.....	145	140
H. P. hours per unit of water.....	15	35
Steadiness, vibration and condition.	30	15
Total	190	190

Maximum brake test figures were secured by operating the engines, belted to the brakes, at their maximum output for a period of thirty minutes while another set of observations was taken. This time the total possible award was 65 points, divided as follows:

Maximum load divided by economy load.....	35
Evenness of load.....	20
Condition of engine.....	10
Total	65

the figures being the same for both the steam and internal combustion engines.

Figures for the plowing test were obtained by sending the engines out in the country, where each was required to make four rounds of a three-quarter mile field of virgin Manitoba prairie sod, pulling an engine gang plow with the number of bottoms in proportion to the brake test load. Traction dynamometers were inserted between the engines and the plows and careful observations again taken as to the fuel, oil and water consumption. A total score of 215 points was possible in this test, divided as follows:

	Internal Combustion.	Steam
Drawbar H. P. hours per unit of fuel	140	120
Drawbar H. P. hours per unit of water	15	35
Acres plowed per hour per economy B. H. P.....	25	25
Quality of plowing.....	15	15
Distance traveled without replenishing fuel	10	5
Distance traveled without replenishing water	0	5
Condition of engine.....	10	10
Total	215	215

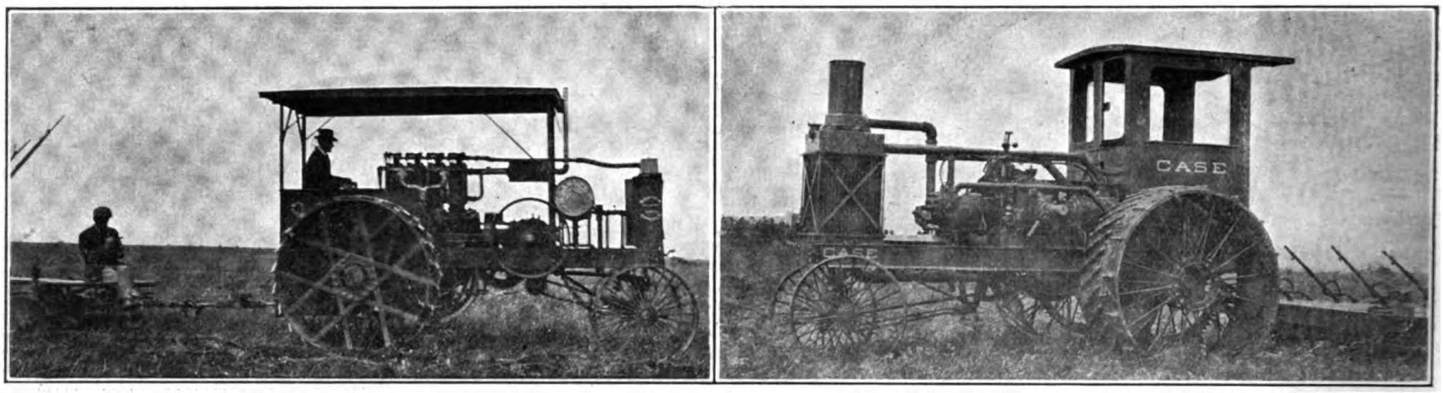
Points for design and construction were determined by the judges, who inspected each engine personally and made up the score, a total of 30 points being awarded as follows:

Accessibility	15
Protection of working parts.....	10
Ease of manipulation.....	5
Total	30

The figures in this case were also the same for steam and internal combustion motors.

For the contest this year the entries were divided into seven classes, two of which were for gasolene, two for kerosene, and three for steam tractors. There was to have been a third class, for gasolene engines under 15 horsepower, but as there were no entries this class was scratched. Class B was for gasolene tractors from 15 to 30 horsepower; Class C, gasolene over 30 horsepower; Class D, kerosene under 30 horsepower; Class E, kerosene over 30 horsepower, and Classes F, G and H were for steam engines. Four of the engines entered in the gasolene classes did double duty, as mentioned before, and went through the tests a second time burning kerosene. These were the Heer, entered as Nos. 1 and 2; the Avery, entered as Nos. 3 and 19; the I. H. C., entered as Nos. 9 and 21, and the Case, entered as Nos. 13 and 24.

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SAWYER-MASSEY GASOLENE TRACTOR AND THE CASE GASOLENE, A FIRST PRIZE WINNER

Many of the best known and largest manufacturers of tractors in the United States and Canada were represented with one or more entries, though it was notable that neither the Gas Traction Co. of Minneapolis nor the Kinnard-Haines Co., of the same city, both winners of former contests, were present. The entrants and their classification is given in the score sheet appended, and a list of the winners in the respective classes appears at the beginning of this article.

The judges of this contest were Prof. L. W. Chase of the Nebraska Agricultural College, Prof. M. L. King of the Iowa State College, and Prof. A. R. Greig of the Saskatchewan University. Arthur C. Frith, a consulting engineer of Winnipeg, acted as engineer in charge, and the officials were assisted in their work by a number of observers appointed by the different concerns taking part in the contest. Their awards were as follows:

Class B.—Gasolene Tractors—1st, J. I. Case T. M. Co. No. 4; 2nd, Goold, Shapley & Muir No. 5; 3rd, Avery Co. No. 3.

Class C.—Gasolene Tractors—1st, Aultman-Taylor Co. No. 12; 2nd, I. H. C. No. 8; 3rd, Holt Caterpillar No. 11.

Class D.—Kerosene Tractors—1st, I. H. C. No. 18; 2nd, Rumely Products Co. No. 16; 3rd, Avery Co. No. 19.

Class E.—Kerosene Tractors—1st, Rumely Products Co. No. 23; 2nd, Aultman-Taylor Co. No. 22; 3rd, I. H. C. No. 21.

Class F.—Steam Tractors—1st, J. I. Case T. M. Co. No. 25. No competition in this class.

Class G.—Steam Tractors—1st, J. I. Case T. M. Co. No. 26. No competition.

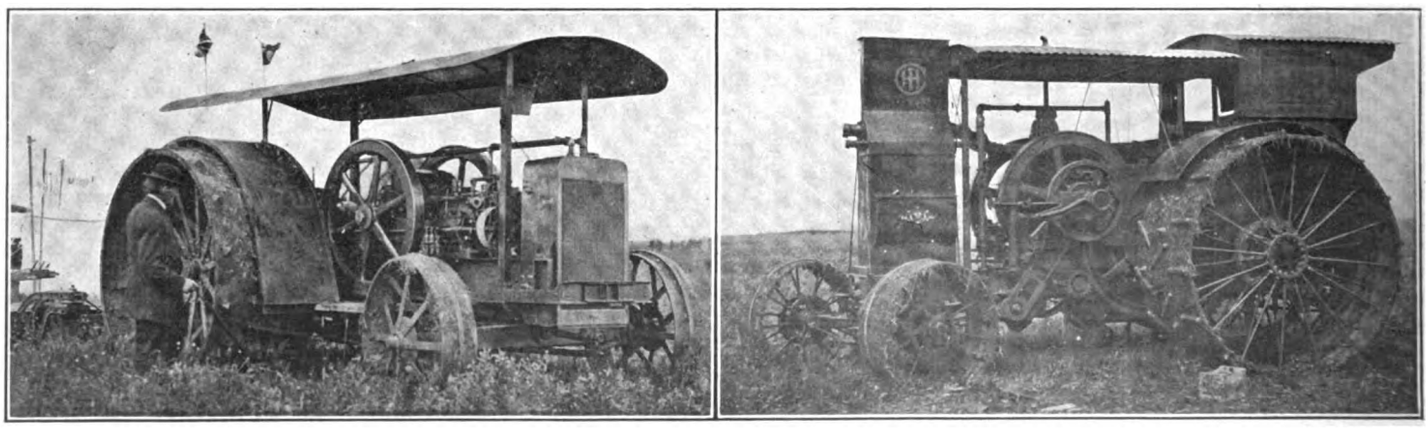
Class H.—Steam Tractors—1st, J. I. Case T. M. Co. No. 27; 2nd, Sawyer-Massey Co. No. 29. Only two entered.

Official entry blanks sent out before the contest announced that the tests would start on July 3rd, but in reality nothing was attempted until the next day, when one lone engine was introduced to the brake and its tests run off. The real start was made on July 5th, when two brakes were put into operation in the shed built for that purpose on the fair grounds, and four engines were put through their initial trials, the judges and officials working from 7 A. M. to 10 P. M. or later without even a stop for lunch. This performance was repeated every day for the next five days, no tests being run on Sunday. It was July 11th before all the engines had completed the brake tests, and plowing was not begun until July 16th, owing to rain and a delay caused by the Exhibition management, who had advertised that the plowing tests would be in full swing during the second week of the fair.

From the standpoint of the automobile engineer, the contest was almost featureless, especially as regards anything new being brought out in the design or construction of the competing engines. The steam engines were all of the same type, a type which has become pretty well standardized through many years of use—that is, with single, double-acting cylinder mounted on brackets attached directly to the horizontal fire-tube boilers carrying from 100 to 150 pounds steam pressure and using soft coal for fuel. The test was hardly representative in this case, because as used in the field a majority of the engines are fired with wheat straw or flax straw, especially during threshing operations, and it can hardly be assumed that the performance on the various fuels will be comparable.

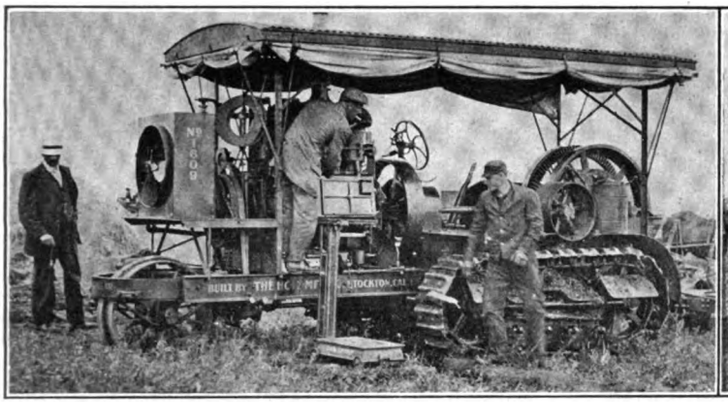
This year there was a notable absence from the contest of gasolene or kerosene tractors equipped with four-cylinder power plants of the automobile type, though motors of this type had been successful in winning the chief prizes both in 1910 and 1911. On the other hand the big, horizontal single-cylinder stationary type engines which were so prominent a year or two ago have almost disappeared. The standard type now in use seems to be the two-cylinder opposed engine, a design which was long ago abandoned by automobile engineers in favor of the vertical motor.

One of the most interesting machines, from a mechanical standpoint, was the entry of the Canadian Holt Co., a subsidiary of the Holt Caterpillar Co., of Peoria, Ill. This tractor was of the "caterpillar" type, using an endless chain-belt running over sprockets instead of the conventional driving wheels. It was equipped with a large four-cylinder Buick type motor with

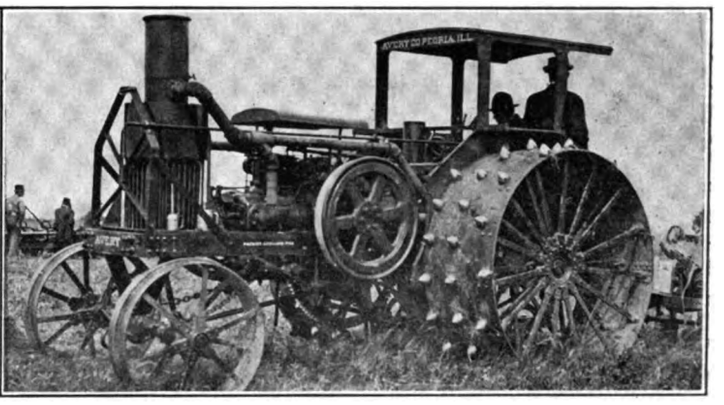


GOOLD, SHAPLEY & MUIR GASOLENE TRACTOR AND I. H. C. KEROSENE, A FIRST PRIZE WINNER

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HOLT GASOLENE "CATERPILLAR" IN CLASS C



AVERY GASOLENE TRACTOR IN CLASS B

caged valves in the head, and power was transmitted from the engine through a two-speed gearset to a jack-shaft geared to the driving sprockets. There was no differential, but individual friction clutches provided for driving by one "caterpillar" at a time when turning corners. This machine secured the third place in Class C.

Another peculiar machine was the tractor entered by the Canadian Heer Engine Co., and manufactured by the Heer Engine Co., of Portsmouth, Ohio. It has a two-cylinder opposed engine mounted under a long hood in front, with a radiator forward, a la automobile, but its peculiarity lay in the chain drive. The driving chains are ordinary link log-chains transmitting power from the countershaft to sprockets on both axles. Both axles are live and both are driven and steered. The sprockets are connected to the live axles by universal joints which allow the axles to turn through a small arc without disturbing the alignment of the driving sprockets. This machine was entered in Class B and Class D, burning gasolene in the one and kerosene in the other, but failed to secure official recognition in either class.

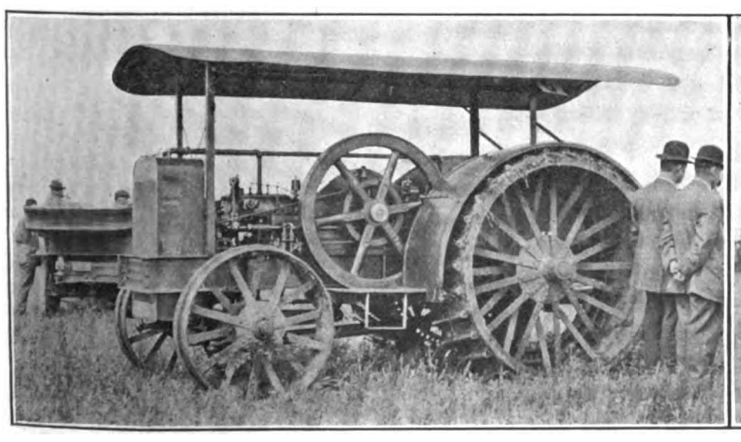
The six engines entered by the International Harvester Co., of Chicago, were all of their standard types which have been on the market for some time and are too well known to need much description. Three of them were of the twin cylinder, counterbalanced type, one was a single cylinder machine, one a twin vertical, and the other a double opposed. Any of them are fitted to handle either gasolene or kerosene by a simple change of the mixing valve. One of the engines in the kerosene class was later withdrawn on account of unsatisfactory adjustments made apparent during the brake test. They secured first place in Class D, a second in Class C, and a third in Class E.

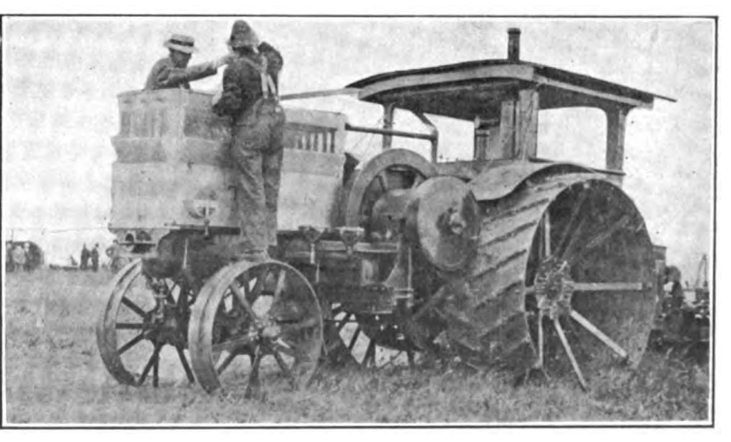
The Rumely Products Co., of La Porte, Ind., had entered three engines of the "Oil Pull" type in the kerosene divisions, two of them differing only in the construction of the cylinder heads, while the third was of a smaller size. Of the two tractors entered in the 30-60 horsepower kerosene class, the judges ruled one out on the ground that the difference between the T-head and L-head cylinders was not sufficient to overcome the ruling against any maker entering two machines of the same type. All of the "Oil Pulls" are of either the twin-cylinder or single-cylinder type, with heavily counterbalanced crank-shafts and fitted with the Secor carburetter, which uses kerosene in conjunction with water injection. It is claimed that the small quantity of water injected with each charge of kerosene keeps down the initial temperature of the explosion, raises the final temperature of the expanding gases and prevents the formation of carbon deposits from the low grade fuel.

In former years the Avery Co., of Peoria, Ill., has been represented in the contests by a light tractor of the motor truck type, fitted with a small four-cylinder vertical engine under the bonnet and special lugged driving wheels to give it traction in the soft ground. This year the little machine was absent, however, and the Avery Co. had but one tractor, which did duty in both the kerosene and gasolene classes, winning a third prize in each. It consisted essentially of a double-opposed motor mounted on a heavy frame and geared through the counter shaft and differential to big driving wheels at the rear.

The Aultman-Taylor Co., of Mansfield, Ohio, was present with two tractors of the twin-cylinder type, one of which competed in the gasolene division and the other in the kerosene class. The one in Class C took first place and the one in Class E took second, which was a very good showing considering that only the two were entered.

The J. I. Case Threshing Machine Co., of Racine, Wis., was represented by two internal combustion and three steam engines. Each of the steamers took first prize in its class, there being no competition in two of the classes. Of the internal combustion engines, one was a two-cylinder opposed using gasolene and the other a twin, burning kerosene. The gasolene engine took first prize in Class B, but the kerosene tractor failed to score, though it also did double duty and used both fuels.





TWO SECOND PRIZE GASOLENE-PROPELLED WINNERS—GOOLD, SHAPLEY & MUIR AND I. H. C.

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The entry of the Diamond Iron Works of Minneapolis was one of the few tractors having automobile type power plants, and it failed to score in the heavy gasolene class in which it was entered.

Goold, Shapley & Muir of Brantford, Ont., was one of the two Canadian firms represented at the trials, and they had entered two tractors of the double opposed type—one a 22 horsepower machine in Class B and the other, which was rated at 45 horsepower, in Class C. The Class C entry was later withdrawn for some unknown reason. The smaller engine, however, completed its tests, taking second prize for its performance in Class B.

The only other Canadian manufacturer represented was the Sawyer-Massey Co. of Hamilton, Ont., who entered one gasolene and one steam tractor. The steam tractor took second to a Case machine, the only other entry in Class G, and the gasolene machine failed to score in Class C, where it



AMERICAN GAS TRACTOR

was entered. It was another of the few four-cylinder machines, but its engine was set transversely on the frame amidships.

Besides the engines in the contest, there were several non-competitors demonstrating near the plowing grounds, among which may be mentioned the "Pioneer 30," manufactured by the Pioneer Tractor Co., of Stillwater, Minn., and the Hackney Auto Plow, made by a St. Paul concern. The "Pioneer" resembled a big automobile of the enclosed type more than anything else, with its automobile radiator and long sloping hood concealing a four-cylinder vertical motor. An enclosed driver's cab at the rear made the illusion complete. The Hackney plow most nearly approaches present-day automobile construction. It has the plows fastened directly on the main frame between the front and rear wheels and directly under the four-cylinder motor. It had only one driving wheel behind and two steering wheels in front.

As to the general points of design in which the tractors compare with current automobile practice, there are practically none outside of the few unimportant features already noted. Several of the machines at Winnipeg displayed tubular radiators for cooling water, but these were very large and quite crude. Many of the engines were equipped with square or round tanks with a few tubes through the center into which the exhaust gases were passed to induce a draft, in lieu of a fan. Carburetters, as the word is generally known in the automobile business, were nowhere in evidence except on the few automobile type motors in use, most of the engines using specially designed mixing or



HACKNEY AUTO PLOW

vaporizing valves, some of which were arranged to use water in conjunction with kerosene. Transmissions were also rather crude affairs, most of them being simple reverse gears, but in one or two cases two forward speeds were provided. Most of the large tractors are designed to travel at speeds of from 1.5 to 2.5 miles per hour when plowing. One manufacturer exhibited a gang-plow in which the bottoms were so attached to an axle driven by the land wheels that the movement of a lever auto-



PIONEER "30"—A NON-CONTESTANT

matically raised the whole twelve or fourteen in succession, thus leaving the furrow even at the end.

It was a notable fact that, while in former contests the hit-and-miss type of governor has been prominent, especially on the twin-cylinder machines, it has now been largely succeeded by the throttling type, which gives much steadier running, especially on the brake. Driving wheels are all of very large diameter, some of them being six or eight feet high, and spur gear transmission is the general rule. Very few of the machines were mounted on springs of any kind, though in one or two cases there had been an attempt to use very heavy spirals.

In steering gears, the old pivoted front axle, with chain and wheel control, seems to persist on most of the machines, but one or two of the newer ones exploited knuckle steering devices. An interesting development of this arrangement is to be seen in the various automatic steering gears which have made favorable headway during the past few years, and which consist generally of a small pilot wheel running ahead of the engine in the last furrow of the former round, and connected by link work to the front axle or steering gear. It was also remarkable how straight a furrow some of the more experienced operators were able to strike across the three-quarter mile field, despite their unwieldy mounts.

While the contest is supposed to be a part of the Winnipeg Industrial Exhibition and the brake tests are carried on within the fair grounds enclosure, it is doubtful



HEER FOUR-WHEEL DRIVE TRACTOR

if the plowing competition forms much of an attraction, on account of the extreme difficulty of getting to the grounds and back. This year the exhibition management provided a special train service on the Canadian Northern Railway to take the spectators out to the plowing field, which was a good 15 miles from the city. The train service was so very intermittent in character, however, that one never knew when a train would leave or how soon he could get back, and as there was nothing in the shape of food or drink to be obtained near the grounds, the ones who ventured out generally went hungry. The story is told of two of the judges who missed the last train and spent the night supperless, in a leaky tent, with a tank wagon and several barrels of oil for bedfellows, while a heavy rain absolutely precluded the possibility of getting an automobile or other vehicle to the scene.

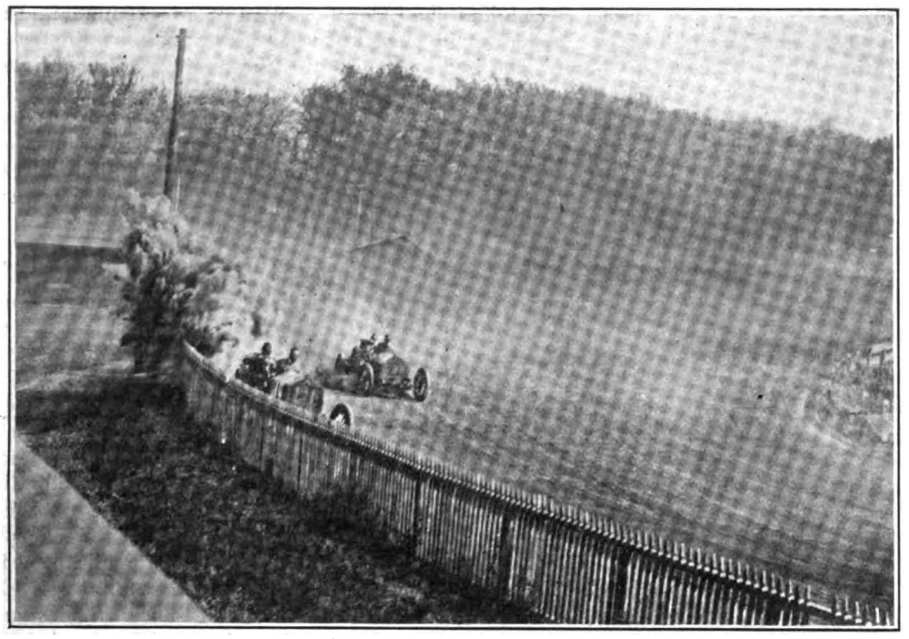
This year there has been considerable talk among the manufacturers' representatives of changing the base of operations from Winnipeg to Peoria, Ill., where the directors of the National Implement and Vehicle Show are said to be anxious to have a competition of their own.

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WHALEN ALMOST "WHOLE SHOW"

Captures Three Events at Wilkes-Barre Meet—All That He Left Are Shared by Three Others.

Neil Whalen, the National pilot, had things all his own way at Wilkes-Barre, Pa., Saturday last, July 27th, where E. A. Cusick offered an eight-sided program on the West Side Driving Park track. In three of the four competitive events in which he drove he led home all other contenders and also made the best time for a single mile, driving the National twice around the half-mile track in 1:15¼.



WHALEN HAS A CLOSE CALL IN THE 10- MILE EVENT

Two Class E events, both of which went for five miles, for cars with displacements under 451 and under 600 inches, respectively, Whalen completed in 7:08 and 7:05, respectively, while the ten-mile free-for-all he decided in 14:05⅘. In the five-mile free-for-all handicap, however, Whalen took only third place, first honors falling to the share of William Burke (E-M-F), who completed the distance in 7:04⅗. John DePalma (Mercer) took second position. William Williams, who guided the Buick entry in the Class E event for cars with displacements under 231 inches, made the best time for the three miles, covering the distance in 4:21½. A five-mile Class E event for cars with displacements under 301 inches was completed by Harvey Ringler (Mercer) in 7:09⅕. A single mile exhibition driven by John DePalma at the wheel of the Mercer in 1:23 marked the close of the meet.

Although considerable work in the way of "manicuring" the track had been performed so that a repetition of the events of the week before, when a race meet staged on the same track by E. A. Moross had to be curtailed because of the dust, would not be necessary, the applications of water, oil and $CaCO_3$ did not leave the track entirely free from the nuisance. When a car swung unduly wide, a great cloud was kicked up, but as the traveled portion of the course was relatively good, no accidents resulted. The summary:

Three miles, Class E, for cars with displacements under 231 inches—Won by William Williams (Buick); second, William Burke (E-M-F); third, Fred Douglas (Ford). Time, 4:21½.

One mile, time trial—Neil Whalen (National). Time, 1:15¼.

Five miles, Class E, for cars with displacements under 301 inches—Won by Harvey Ringler (Mercer); second, John DePalma (Mercer). Time, 7:09⅕.

One mile, time trial—John DePalma (Mercer). Time, 1:23.

Five miles, Class E, for cars with displacements under 451 inches—Won by Neil Whalen (National); second, Harvey Ringler (Mercer); third, John DePalma (Mercer). Time, 7:08.

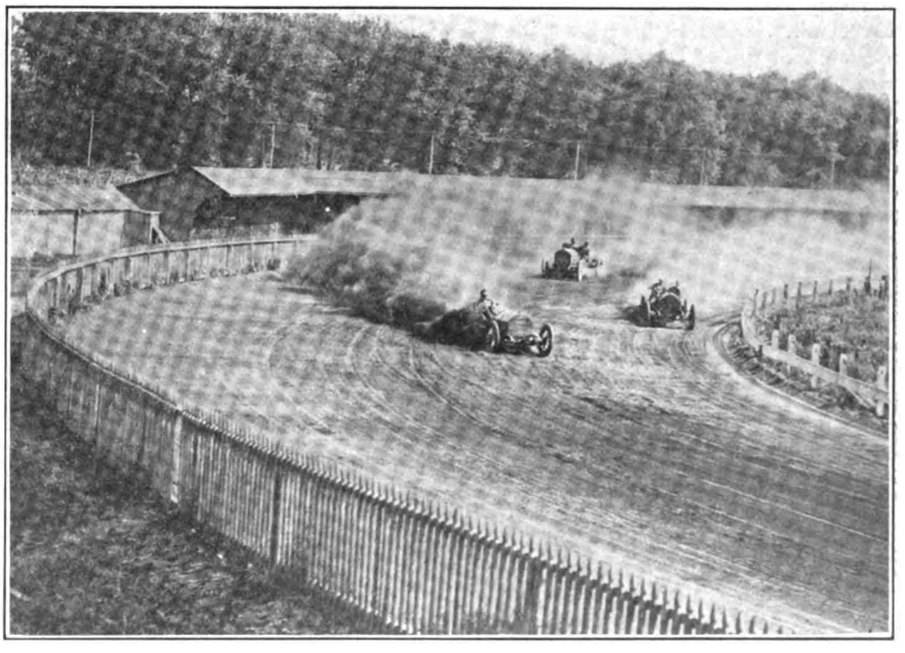
Five miles, Class E, for cars with displacements under 600 inches—Won by Neil Whalen (National); second, John DePalma (Mercer); third, William Freitag (Marmon). Time, 7:05.

Ten miles, free-for-all—Won by Neil Whalen (National); second, Harvey Ringler (Mercer); third, John DePalma (Mercer). Time, 14:05⅘.

Five miles, free-for-all, handicap — Won by William Burke (E-M-F); second, John DePalma (Mercer); third, Neil Whalen (National). Time, 7:04⅗.

Whalen and Williams Divide at Scranton.

Honors were pretty well divided between William Williams, who piloted a Buick car, and Neil Whalen, who was at the wheel of a National, at the race meet in Scranton, Pa., on Wednesday, July 24th, promoted by E. A. Cusick. Two events went to the Buick pilot, while Whalen took all save one of those that remained on the seven-event program. The odd trick went to John DePalma, who drove an exhibition mile in his Mercer in 1:20⅗. The summary:



JOHN DE PALMA (MERCER) LEADING IN THE FIVE-MILE RACE

Three miles, Class E, for cars with displacements of under 231 inches—Won by William Williams (Buick); second, Fred Douglas (Ford). Time, 4:32⅖.

One mile, time trial—Neil Whalen (National). Time, 1:20.

Five miles, Class E, for cars with dis-

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placements of under 301 inches—Won by William Williams (Buick); second, Harvey Ringler (Mercer); third, John DePalma (Mercer). Time, 6:30.

One mile, time trial—John DePalma (Mercer). Time, 1:20⅗.

Three miles, Class E, for cars with displacements under 451 inches; first heat—Won by William Williams (Buick); second, Joe Foster (Marmon); third, E. F. Stein (Buick). Time, 4:02¼. Second heat—Won by Neil Whalen (National); second, John DePalma (Mercer). Final heat—Won by Neil Whalen (National); second, Joe Foster (Marmon). Time, 4:06.

One mile, time trials—William Williams (Buick). Time, 1:20⅗. William Freitag (Fiat). Time, 1:14. Fred Douglas (Ford). Time, 1:35.

Five miles, Class E, for cars with displacements of under 600 inches—Won by Neil Whalen (National); second, William Williams (Buick); third, John DePalma (Mercer). Time, 6:52.

Burman has a Big Day at Rochester.

Moross routine, with but one variation, was followed at the race meet run on the Critten Park track, Rochester, N. Y., on Saturday last, July 27th, under the auspices of E. A. Moross. The variation was caused by William Knipper, who drove a Benz car in the two-mile free-for-all handicap into first position, his time being 3:12⅖, The other four events which went to make up the program went to Burman. The summary:

Three miles, Class E, for cars with displacements of under 600 inches—Won by Burman (Cutting); second, Kyle (White); third, Sutton (Schacht). Time, 4:04.

Two miles, for the Remy Brassard and trophy; first heat—Won by Robert Burman (Benz); second, MacDonald (Benz); third, Hickman (Mercedes). Time, 2:35. Second heat—Stopped when Hickman (Mercedes) went through the fence. Third heat (one mile)—Won by Robert Burman (Benz); second, Hickman (Mercedes); third, Kyle (White). Time, 1:29.

One mile, time trial—Burman (Benz). Time, 1:08.

Three miles, Class E, for cars with displacements of under 600 inches—Won by Burman (Cutting); second, Kyle (White). Time, 4:09⅖.

Two miles, free-for-all, handicap—Won by William Knipper (Benz); second, Kyle (White); third, Sutton (Schacht). Time, 3:12⅖.

Police Chief Proposes Sealing Cut-outs.

Chief of Police Carter of Columbus, Ohio, is one deadly enemy of the muffler cut-out and is causing gratification in the hearts of others who fail to see any necessity for making an automobile "bark like a dog" by an ordinance which he proposes to have introduced in the city council requiring muffler cut-outs to be officially sealed and making it a misdemeanor to be found with such a seal broken. The proposed seals would be little lead arrangements and would be put on for 50 cents by an official sealer. Should a seal be broken while in the country the car may proceed into the city, but at once must be "re-sealed." The measure would cover motorcycles as well.

Waddington, he Saddles his Motor Car.

If photographs do not lie, Bob Waddington is something of a wonder. Waddington is a ranchman, likewise a cowboy, who claims Cisco, Tex., as his home. He is an up-to-date chap, as his possesison of a Cole car, which he has driven for 28,000 miles, serves to indicate. Of course, mere possession of a motor car is not wonderful, but, if you will believe it, Waddington has transferred a saddle from the back of a broncho to the bonnet of his automobile, and they do say that the way he can rope



WADDINGTON BEFORE THE CAMERA

a steer while seated astride a hot engine is a sight to behold. The accompanying photograph shows the saddle so positioned, but when he faced the camera Robert deemed it wise, or at any rate picturesque, to "stand on his feet" when he let loose the lariat; but it is safe to say that he does not rope many steers when standing in that position while bounding over the bounding prairies of Texas. When Robert first placed the saddle on the Cole bonnet, it is stated that his friends laughed.

Elephant Yarn of Elephantine Proportions.

Every story which emanates from the jungle of a distant country generally is tinged with a bit of suspicion as to authenticity, and when an English newspaper prints the tale of how an elephant was captured on the Island of Sumatra by a native of Switzerland and was then given an automobile ride to the place of his captivity, every man must be his own judge of the reliability of the source of information. "The elephant, which was well roped," says the report, was driven to the nearest path in the forest, and with great difficulty the motor car arrived at the spot, a kind of platform replacing the body. The elephant was induced to mount the platform and was strongly secured to it. The trip to Siantar started, but difficulties at once arose, because the elephant, whose trunk was free, used it to examine in turn the chauffeur, the seats in front, the machinery, and finally the guiding wheel, his last maneuver nearly upsetting the car, which was brought to a stop, as the journey was becoming dangerous. The elephant's trunk was then strapped to his body and the car arrived at Siantar without further incident."

Disbrow's Clean-up at Michigan Meet.

Louis Disbrow, who at various times during the day piloted a Simplex, a Case and the rebuilt racing machine "Jay-Eye-See," practically swept the boards clean at the race meet which was run on the Comstock Park track, Grand Rapids, Mich., Saturday, July 27th, and which was fathered by the Grand Rapids Automobile Club. He accounted for all save one of the seven events on the program; the exception, a three-mile free-for-all handicap, was won by Joe Nikrent (Case) in 3:49.10, with Disbrow in second place. The summary:

One mile, time trials—Louis Disbrow (Case), time, 1:30; William Endicott (Schacht), time, 59:75; Joe Nikrent (Case), time, 1:01.30; Louis Disbrow (Jay-Eye-See), time, 58:40; Louis Disbrow (Simplex), time, 54:55.

Five miles, for cars with displacements of 231-300 inches—Won by Louis Disbrow (Case); second, Wm. Endicott (Schacht); third, Joe Nikrent (Case). Time, 6:05.70.

Ten miles, time trial—Louis Disbrow (Simplex). Time, 9:08.5.

Four miles, Australian pursuit—Won by Disbrow (Simplex). Time, 3:59.10.

One mile, time trial—Louis Disbrow (Jay-Eye-See). Time, 57:95.

Three miles, free-for-all, handicap—Won by Joe Nikrent (Case); second, Louis Disbrow (Case); third, William Endicott (Schacht). Time, 3:49.10.

One mile, time trial—Louis Disbrow (Simplex). Time, 53:60.

Jersey's Tags to be Maroon and White.

Fancy colors of the college variety and combination are to be abandoned in New Jersey in the enameling of the state automobile license tags because, as State motor vehicle commissioner Job H. Lippincott says, he has used up all the combinations extant with the exception of scarlet and black, and the commissioner doubts the advisability of using these colors because of the likelihood that the numerals would not be very easily distinguishable. He has, after deliberation, selected white and maroon as the scheme for the 1913 tags, the field to be white and figures maroon.

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FIFTEEN TIE FOR TEXAS TROPHY

And As a Result, Lottery Decides Award in Farmers' and Ranchers' Tour—Others Receive Real Money.

Neither the limestone roads of Texas, which are very prolific with regard to fine dust and small, sharp stones, nor the speed ordinances in force in the towns passed en route, could have kept even the most conservative contenders in the Farm and Ranch tour, which started from Dallas on the morning of Monday, July 22nd, for a six-day run, from reaching the half-way point, San Antonio, two days ahead of schedule, had it not been for the fact that the pacemaker was a "strong-arm" man. His athletic propensities, however, were not at all times equal to the task of curbing the desire for speed of the most ambitious of the ranchmen, so that on the afternoon of the first day it was necessary for him to chase one of the contenders who had slipped past him at Hillsboro, the noon control, for five miles and inform him that he was participating in a tour, not a road race. Waco, the night control, slightly over 100 miles from the starting point, was reached hours before schedule time, but without mishap or penalty to any of the contenders.

The tour, which was the first of its kind and wholly devoid of trade influence, embraced a course some 650 miles in extent leading to San Antonio by way of Waco and Austin. The return, however, was made by way of Taylor and Mexia. The tour was conducted under Grade IV rules, by which contestants are penalized only for being late at controls and for work done on the motor while on the road.

The second day's run practically was a repetition of the first leg, the 132 miles to Austin being covered in good season without mishap or penalty. Wednesday evening saw the contenders in San Antonio, 82½ miles from Austin. The going had not been so smooth on the third day of the journey, but despite the fact but three of the 27 contenders failed to finish with clean slates.

Thursday evening saw the tourists in Taylor after an uneventful 100-mile run from San Antonio, the route having led them through San Marcos and Austin. On Friday, July 26th, the longest and hardest day's run—145 miles, from Taylor to Mexia—was covered, but not without mishap. Most of the penalties which were attached to the 12 contenders who failed to finish with clean score boards, were earned on this leg of the journey. Several, however, who had covered the five-days' route without mishap tripped up on the last 100 miles of the tour, from Mexia to Dallas.

In all, 15 of the contenders finished with clean scores, so that the disposition of the silver trophy offered by Col. F. P. Holland to the contender who made the best showing, had to be determined by drawing lots. W. H. Camp, of San Gabriel, who had piloted a Reo car, drew the prize. The other 14 contenders who had had a claim on the trophy before the lots were drawn, were not totally unrewarded, however, for the $900 in gold which was to have gone as 5, 3 and 1 to the contenders with the three best scores, was divided among them, each man receiving $64.27.

The 15 who drew for the trophy were: W. R. Bishop, Franklin; J. M. Howe, E-M-F; W. R. Mickle, Chalmers; J. R. Pennington, Buick; R. B. Dunn, Mitchell; B. W. Bean, Studebaker; D. W. Rutherford, Maxwell; O. L. Sims, Overland; J. Mantel, Hudson; H. V. Hendrick, Buick; S. J. Hall, Hupmobile, W. H. Camp, Reo; W. R. Newton, Ford; R. G. Roach, Ford; L. B. Blair, Maxwell.

Banquet Tops off Four States Tour.

Thursday evening, July 25th, witnessed 80 weary, sunburned but optimistic tourists, erstwhile participators in the annual Four States Tour of the Indiana Automobile Dealers' Association, gathered around the festive board at the German House, Indianapolis, partaking of a "dutch" supper and making merry generally. It was in the nature of a finishing touch to the two-weeks "boosting Indiana" expedition. During the course of the evening the heartfelt thanks of each and every member of the party were tendered to the officials of the tour, D. S. Menasco, J. M. Ward and W. D. Edenburn, to whom the success of the tour was attributed. At the conclusion of the speech-making, which was not continued sufficiently long to become wearisome, and during which it was disclosed that between 70 and 80 cars had been disposed of by the various agents during the tour, besides which many good "leads" were obtained, together with considerable advertising of the "worth-while" variety, the tourists were entertained by a vaudeville performance.

Token that Relieves Roadside Distress.

Marking either a delicate tribute to the dependability of the automobile, or philanthropy that is out of the ordinary, the General Committee of the Royal Automobile Club of Great Britain has developed a scheme which should result to the material advantage of members and associate members who are periodically followed by a "jinx," even if it does deplete the club's treasury. The scheme, briefly, is to provide members and associates with a token the exhibition of which in the case of trouble will ensure quick relief from any of the numerous R. A. C. repair stations that dot the country. The modus operandi provides that in case of breakdowns the token must be sent by the most convenient messenger to the nearest repair station, when a repair car equipped to tow the disabled car to the shop or to convey the passengers a reasonable distance to their homes or headquarters or to a railroad station will be dispatched at once to the scene of the trouble. Not only will the token secure the immediate attention of the R. A. C. repair station, which will be assured by its presentation of the genuineness of the distress, but the cost of the relief expedition will be borne by the club.

France Forms "Le Club des Cent."

Taking a leaf out of an American book, the idea having originated with the formation of the 50,000-mile Maxwell club, a number of French enthusiasts who are residents of Paris and environs have formed a new automobile club which has as its somewhat unenlightening title "Le Club des Cent." The designation implies that the maximum membership is limited to 100. Eligibility requires that each prospective member shall have covered in an automobile 40,000 kilometers, which is equal to 24,854 miles and is, approximately, the circumference of the earth. In addition to this qualification, it is said that the club will be very exclusive and will be recruited "from the elect of the worlds of politics, art and commerce."

Imprisoned for Murder, Acts as Chauffeur.

Many instances are cited of ex-convicts being the operators of taxicabs, but that a bona fide penitentiary prisoner, and one serving time for murder at that, should be a chauffeur is the story which finds origin in the penitentiary at Columbus, O. The prisoner is Bushrod Kelch, who was sentenced to 20 years from Cleveland, and, being a "trusty," he is employed to drive the institution's motor truck, which was delivered last Saturday, July 27, between the "pen" and the prison farm at Orient, some distance away, thus placing himself in a different class than those "trusties" who are compelled to be content as drivers of horses.

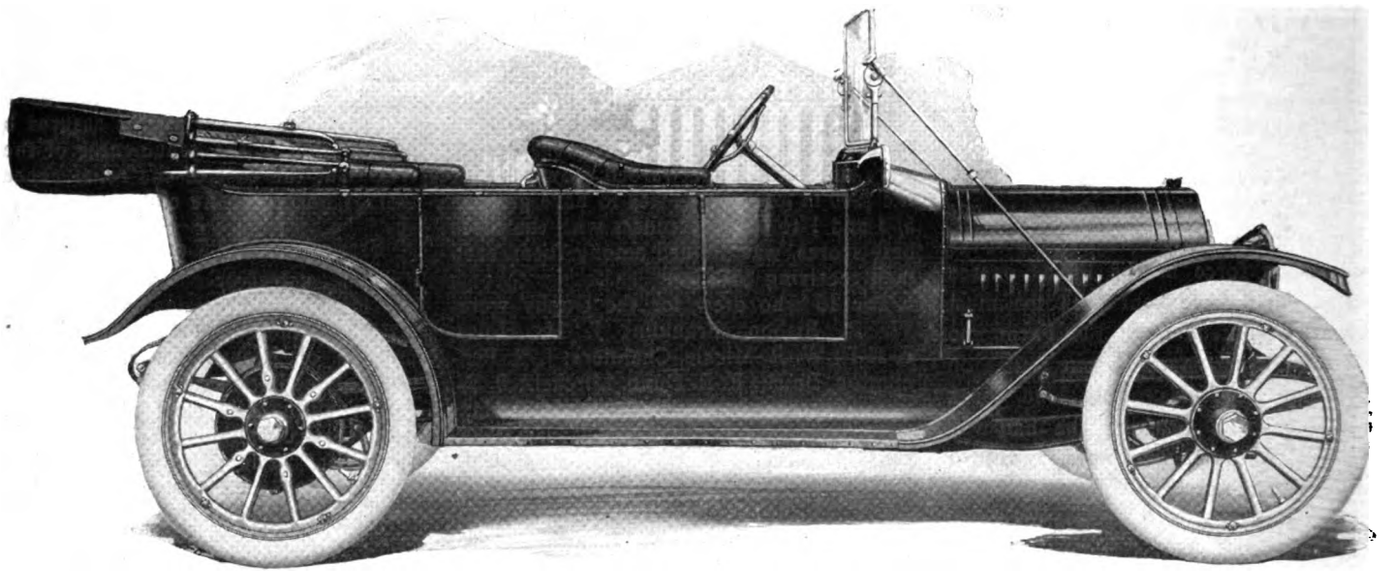
To Attach Taxicab Bandit's Car.

Geno Montani, the taxicab operator whose car was used several months ago in a sensational robbery of a bank messenger in New York City, may lose his car through the transaction. A sheriff's jury on Monday awarded a writ of execution in favor of the East River National Bank, the loser of the funds, and besides being directed against the robbers and jewelry they are said to possess, the paper may be the means of taking the taxicab as well. The amount stolen was $25,000, $3,965 of which has been recovered.

Minneapolis Tour Postponed Two Weeks.

Because of the tardiness in receiving the sanction for the event from the contest board of the A. A. A., the annual reliability tour of the Minnesota State Automobile Association, which was to have left St. Paul on the morning of July 25th, the start was postponed until Thursday, 8th inst. The route will lead to Winnipeg and return and will be covered in seven days.

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1,012,879. Gripping Device for Securing Auxiliary or Spare Rims to Automobile Wheels. Albert Manson, Paris, France. Filed July 1, 1909. Serial No. 505,443.

1. In a device for attaching an additional rim to a vehicle wheel, a clamp composed of a double pair of hinged jaws each jaw having a curved portion for clamping to a part of a vehicle rim, and with side portions for clasping a wooden portion of the vehicle rim, the double pair of jaws being formed to clasp a wheel spoke between the same, in combination with bolts and corresponding spring controlled thumb turned nuts holding the jaws in place, and also holding the spoke securely within the jaws.

1,012,933. Means for Operating the Gasolene Tank Valves of Motor Cars. Charles Lee Thomas, Canisteo, N. Y. Filed Sept. 6, 1910. Serial No. 580,614.

1. Means for operating the gasolene tank valve of a motor car, having in combination a hollow casing provided with a key hole, a rotatable operating rod having at one end a clutch head capable of detachable engagement with the handle of said valve and at its opposite end portion a bolt seat and a wrench seat, and a movable bolt working in said casing and having releasable engagement with said bolt seat, said bolt having a cam-beveled outer face, and a key having a beveled end capable of engagement with the cam outer face of said bolt to release the same, and a recess capable of engagement with the wrench seat of said rod to turn the same.

1,012,936. Front Wheel Drive for Automobiles. Peter Turon, Los Angeles, Cal. Filed Dec. 27, 1909. Serial No. 535,188.

1. In combination with a chassis, the differential, and a divided front axle of an automobile, a casing for the axle, a pair of arms on each end of said casing, a journal pivoted thereto to turn in a horizontal plane, a wheel hub on the journal, said hub having notches in the end thereof, a driving shaft, a universal coupling in said driving shaft within the pivotal axis of said journal, said shaft extending slidably through said journal and provided at its outer end with a squared portion of the shaft, lugs on said plate engaging the notches in the hub, and means for yieldingly holding said plate in engagement with said journal and said hub comprising a cap adapted to fit over the end of said hub, and a coiled spring in said cap adapted to press against said plate.

1,012,951. Shoe for Tires. Cyrus A. Whyland, Marion, Mass. Filed Apr. 27, 1911. Serial No. 623,629.

An armor member consisting of a bent body portion adapted to be disposed around the tread of a tire, two flanges each having an orifice, extending laterally from the body portion, each end of the body portion being cut in two places to form central flanges bent over the body portion at its center, and wings which are bent laterally.

1,013,048. Spark Plug. Charles B. Nelson, Lindsborg, Kans. Filed Dec. 6, 1910. Serial No. 595,919.

A spark plug comprising a metal shell, a tubular body fitted to the lower end of the shell and having its intermediate portion contracted to form an annular electrode, a core of insulating material secured within the shell and having its lower end extending into the upper space of the tubular body, an electrode arranged within the core and having its lower end extending into the contracted space of the tubular body, and a ball valve located in the lower space of the tubular body and adapted to be moved upward by the force of explosion to close the lower end of the contracted portion of the tubular body.

1,013,082. Carburetter. Robert Symmonds, Jr., Kenosha, Wis., assignor to Thomas B. Jeffery, Kenosha, Wis. Filed Aug. 2, 1906. Serial No. 328,871.

In a carburetter for explosive engines, the combination with a primary mixing chamber having an inlet port for a combustible fluid and an outlet port for a combustible mixture, of means for supplying air to said mixing chamber, an auxiliary mixing chamber with which the primary mixing chamber communicates, a plurality of valves controlling air ports leading to said auxiliary mixing chamber, and springs of different tensions for retaining said valves seated, whereby said valves will successively open as the speed of the engine increases.

1,013,085. Tire for Vehicle Wheels. William T. Whitlock, Chicopee Falls, Mass., assignor to The Fisk Rubber Company, Chicopee Falls, Mass., a Corporation of Delaware. Filed Apr. 19, 1911. Serial No. 622,000.

In a resilient tire, a circumferential rib located on the median line of the tire, and a rib located on either side thereof equidistant therefrom, all of said ribs being substantially radial to the tread surface of the tire and integral therewith, and traction ribs extending from either side of said central rib, the outer ends of said traction ribs being spaced apart from the ribs on either side of said central rib.

1,013,273. Wheel. William W. Byam, Chicago, Ill. Filed May 24, 1910. Serial No. 563,132.

In a device of the class described, a rim composed of two circumferentially continuous annular sections having inwardly extending projections thereon, a transversely split channel lock ring having outwardly projecting side flanges, said rim sections resting upon the outer edges of said side flanges and being separated from the central part of said lock ring by a clearance space, said projections being received between said side flanges, and means for expanding said lock ring.

1,013,282. Vehicle Wheel. Hugh Duncan, Langside, Glasgow, Scotland. Filed June 26, 1911. Serial No. 635,281.

In a vehicle wheel, in combination, a rim, a tread consisting of a series of resilient sections supported on said rim, said sections each comprising a body portion, and flange members detachably securing said tread sections to said rim, said members having ribs, extending between the bases of said tread sections, and inturned lips engaging said bases and clamping the same immovably to said rim and extending part way between the body portions of said sections, said lips being recessed to receive said body portions.

1,013,293. Starting Device for Internal Combustion Engines. Anthony P. Hinsky, Brooklyn, N. Y. Filed May 2, 1911. Serial No. 614,618.

A cranking apparatus for internal combustion engines consisting of a supplemental shaft mounted in axial line with the crank shaft of the engine and movable toward and from the same and adapted to engage the same, a spring normally holding said supplemental shaft out of engagement with the crank shaft, a crank arm mounted on the outer end of the supplemental shaft and provided with an internal chamber, a gear mounted on said shaft within said chamber and keyed to said shaft, a handle spindle mounted in the outer end of said crank arm, a gear mounted on said spindle within said arm and keyed to said spindle, intermediate gears mounted in said arm and meshing with said first named gears and with each other, a ratchet wheel secured to the inner side of the said arm where the supplemental shaft passes therethrough and through which said supplemental shaft passes, and a plurality of suitably supported pawls adapted to engage said ratchet wheel.

1,013,374. Detachable Rim for Pneumatic Tires. Walter E. Copithorn, Natick, Mass. Filed June 20, 1910. Serial No. 567,779.

In a wheel, the combination with a wheel body, of a detachable tire-receiving rim, a circular expansible locking member for locking the detachable rim to the wheel body, and a single tapered screw screw-threaded into and extending transversely of the wheel body and co-acting with the locking member to expand it and thereby lock the rim in place.

1,013,384. Shock Absorber. Ernst Flentje, Cambridge, Mass. Filed Oct. 29, 1909. Serial No. 525,285.

In a shock absorber, the combination with a cylinder to contain liquid, of a piston therein, said piston having a plurality of ports, a valve for said ports situated above the piston, a U-shaped member secured to the valve and extending through the ports beneath the piston for limiting the upward movement of the valve, and a cushioning device on the U-shaped member.

1,013,387. Vehicle Rim. James E. Hale, Akron, Ohio, assignor to The Goodyear Tire and Rubber Company, Akron, Ohio, a Corporation of Ohio. Filed Sept. 11, 1911. Serial No. 648,725.

The combination with a vehicle wheel of a contractible ring mounted thereon, the outer face of said band provided with a shallow groove having inclined sides, a pair of wedge-shaped rings mounted in said groove, a rim mounted on said wedge-shaped rings, and means for forcing said wedge-shaped rings laterally away from each other to cause them to detachably engage the inner face of said rim for holding the latter in place and simultaneously compressing the said grooved ring on said vehicle wheel.

1,013,473. Vehicle Brake. Harald Eduard Frederick Rude Block, Copenhagen, Denmark. Filed Feb. 27, 1911. Serial No. 611,276.

In a motor car in combination, a wheel brake, means for operating same from the chauffeur's seat only, a releasable handle placed in the tonneau, a wire affixed to the said handle, with a round turn wound around the driving shaft of the motor and thereupon connected with the wheel brake, guide pulleys for the said wire and means for breaking the ignition of the motor, said latter means to be manipulated from the passengers' seats.

1,013,577. Vehicle Spring. Frank Wheeler, Orange, Cal. Filed July 5, 1910. Serial No. 570,493.

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A vehicle spring structure comprising an axle engaging member, bell crank levers pivoted to the opposite ends of said axle member, and each formed with long and short arms, their shorter arms extending below the axle, a load supporting compression spring set between the ends of the depending shorter arms, the said bell crank levers also having abutment arms extending above the axle, a compression rebound spring set between said abutment arms, one bell-crank lever having integral spring seats upon its depending short arm and its abutment arm, while the other bell crank lever carries adjustable spring seats upon its arms adapted to be tightened against said springs sufficiently to prevent their displacement.

1,013,596. Tire. Alfred Freschl, Chicago, Ill. Filed July 8, 1908. Serial No. 442,522.

A tire comprising a body part and a detachable tread, the body part of the tire being yieldable and having upwardly extending overhanging side flanges, the tread member comprising a plurality of vertically extending relatively thin layers of yieldable material, the tread having a circumferentially extending cut out portion in each side whereby to form a projecting tongue to engage under the overhanging flange of the body part, and whereby to provide a circumferentially extending cutout portion in each side upper surface of said flange, and rods extending through the respective flanges of the body part, and through the various layers of the tread part, and means for adjusting said rods lengthwise whereby to bindingly engage the flanges of the body part with the tread part and to compress the layers of said tread part.

1,013,656. Spring Wheel. William D. Hester, Durham, N. C. Filed Dec. 16, 1910. Serial No. 597,602.

A spring wheel comprising a hub, a rigid metal rim, spokes connected to said hub and rim, a tire rim comprising curved sections pivotally connected together, studs projecting from some of said sections, said studs extending inwardly and adapted to move through holes in the rigid metal rim, said studs each having a bore or socket, a pin connected to the hub and mounted to move in said bore, and a spring surrounding said pin and bearing at one end against said stud, and lock nuts on said pin for adjusting the tension of said spring.



INDEX TO ADVERTISERS



A
Abbott Motor Car Co..... 70
Adamson Mfg. Co..... 68
Ajax-Grieb Rubber Co..... 56
American Ball Bearing Co..... 18
American Locomotive Co..... 66
American Motors Co..... 71
American Starter & Carburetor Mfg. Co..... 67
Argo Electric Vehicle Co..... 58
Atlas Auto Supply Co...Inside front cover
Atwater Kent Mfg. Works..... 57
Automobile Supply Mfg. Co..... 64

B
B & L Caster Axle Co..... 64
Badger Brass Mfg. Co..... 70
Bantam Anti-Friction Co..... 67
Barthel, Daly & Miller..... 60
Bartholomew Co..... 65
Benz Auto Import Co..... 60
Billings & Spencer Co..... 54
Bosch Magneto Co..... 63
Bossert Co..... 56
Brett Co., J. S..... 72
Briggs-Detroiter Co..... 66
Brown-Lipe-Chapin Gear Co..... 67
Bush Mfg. Co..... 63

C
Cartercar Co..... 66
Champion Ignition Co..... 65
Champion Spark Plug Co..... 72
Clark-Carter Automobile Co..... 66
Classified Advertising 52-53
Cole Motor Car Co..... 64
Colonial Electric Car Co 70
Consolidated Mfg. Co..... 70
Continental Motor Mfg. Co..... 56
Covert Motor Vehicle Co..... 71
Cox Brass Mfg. Co..... 65
Cramp, Wm., & Sons, Ship & Engine Building Co..... 69

D
Dayton Auto Truck Co..... 70
Dayton Rubber Mfg. Co..... 56
Dean Electric Co..... 13
Detroit & Cleveland Navigation Co... 72
Diamond Chain & Mfg. Co..... 61
Diamond Rubber Co..... 69
Double-Fabric Tire Co..... 68

E
Electric Welding Products Co..... 72
Empire Automobile Co..... 71
Empire Tire Co..... 68

F
Fedders Mfg. Works..... 72
Federal Miniature Lamp Works..... 57
F. I. A. T..... 70
Fireproof Garage Co..... 56
Firestone Tire & Rubber Co..... 65
Ford Motor Co..... 71
Franklin Automobile Co..... 71
Fulton-McCutchan Co..... 17

G
G. C. A. Mfg. Co..... 67
Goodyear Tire & Rubber Co..... 57
Grant-Lees Machine Co..... 56
Great Northern Hotel..... 62
Grossman Co., Emil..... 56

H
Hartford Auto Parts Co..... 1
Hartford Suspension Co..... 57
Havers Motor Car Co..... 66
Haynes Automobile Co..... 70
Hodge & Graves Co..... 69
Hupp Motor Car Co..... 71
Hyatt Roller Bearing Co..... 67

I
Ignition Starter Co..... 56
Inner Shoe Tire Co..... 57
International Accessories Corp..... 67
Inter-State Automobile Co..... 65
Invincible Starter Co..... 67

J
Jackson Automobile Co..... 66
Jeffery-Dewitt Co..... 69
Jencick Motor Corp..... 65
Jones & Co., Phineas..... 72
Jones Speedometer 69

K
Kellom Co., Chas. F..... 57
Kelly-Springfield Tire Co..... 59
King Motor Car Co..... 65
Kinsey Mfg. Co..... 68
Kissel Motor Car Co..... 60
Kline Motor Car Corp..... 66
Knight-Davidson Co..... 68
Knox Automobile Co..... 14

L
Lauth-Juergens Motor Car Co..... 63
Leather Tire Goods Co..... 56
Locomobile Co..... 55
Lovell-McConnell Co., Inside back cover

M
Mayo Radiator Co..... 3
McCue Co..... 12
McGraw Tire & Rubber Co..... 56
Metz Co..... 57
Michigan Motor Car Co..... 10
Michigan Crank Shaft Co..... 57
Miller, Chas. E..... 3
Minerva Hardware Mfg. Co..... 57
Moline Automobile Co..... 48a
Mosler & Co., A. R..... 56
Moss Photo Engraving Co..... 59
Motor Car Equipment Co..... 57
Mott Wheel Works..... 72
Motz Tire & Rubber Co..... 57
Mutty Co., L. J..... 57
M & P Electric Vehicle Co..... 4

N
National-Acme Mfg. Co..... 9
National Gas Engine Starter Co..... 64
National Motor Vehicle Co..... 71
New Departure Mfg. Co..... 64
Niagara Sales Co..... 54
Nordyke & Marmon Co..... 60

O
Otho Motor Co..... 19
Owen & Co., R. M..... 57

P
Parish & Bingham Co..... 67
Penn Spring Works..... 56
Pennsylvania Rubber Co.....Front cover
Perfection Spring Co..... 56
Piel Co., J..... 5
Prest-O-Lite Co..... 56
Pullman Motor Car Co..... 8

R
R. C. H. Corporation..... 65
Reliance Speedometer 51
Remy Electric Co..... 60
Republic Rubber Co..... 64
Royal Equipment Co..... 69
Rutenber Motor Co..... 68

S
Schrader's Sons, A., Inc..... 62
Shawmut Tire Co..... 70
Sheldon Axle Co..... 2
Smith Co., A. O..... 68
Sparks-Withington Co..... 58
Speedwell Motor Car Co..... 71
Splitdorf Electrical Co..... 69
Springfield Metal Body Co..... 57
Standard Roller Bearing Co..... 57
Standard Welding Co..... 11
Stearns Co., F. B..... 66
Studebaker Corporation.....Back cover

T
Timken-Detroit Axle Co..... 7
Tobias, F. H..... 56
Twitchell Gauge Co..... 61
Typhoon Signal Co..... 56

U
United Rim Co..... 72
United States Tire Co..... 64

V
Valentine Co., J. H..... 62
Volkmar Auto Starter Co..... 69

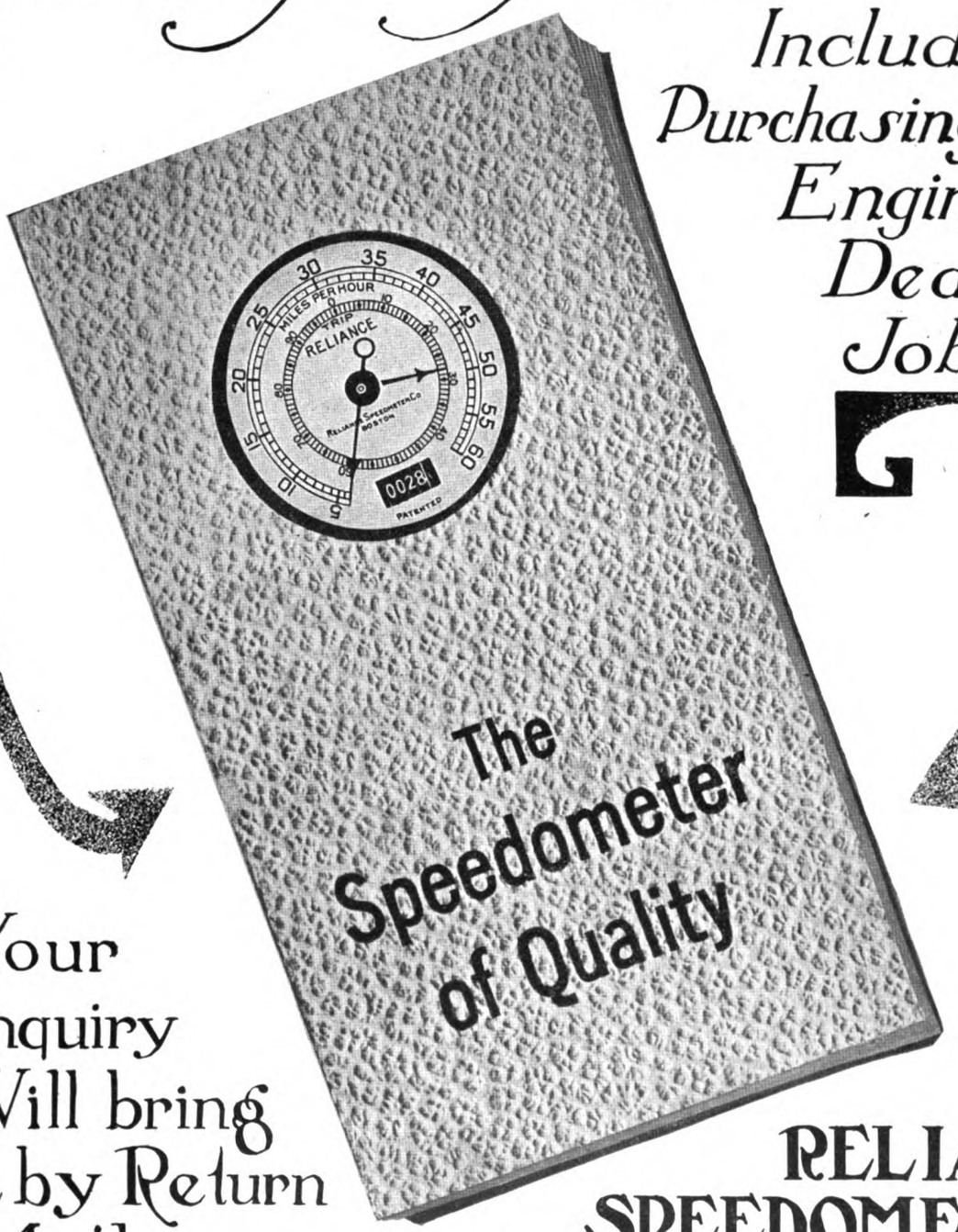
W
Warm Hand Steering Wheel Co..... 6
Warner Gear Co..... 63
Warner Instrument Co..... 15
Weed Chain Tire Grip Co..... 57
Willard Storage Battery Co..... 16
Willys-Overland Co..... 20
Wisconsin Motor Mfg. Co..... 64
Woodstock Hotel 58

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This Handsome Brochure

Should be Read from Cover to Cover by Every Man in the Trade

Including
Purchasing Agents
Engineers
Dealers
Jobbers



Your Inquiry Will bring it by Return Mail

RELIANCE SPEEDOMETER CO.
134 ELIOT STREET, BOSTON MASS.

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For Sale—Wants—Exchange

15 cents per line of six words, cash with order: — In capitals, 25 cents per line —

A market place where Dealers, Jobbers and Manufacturers may buy, sell or trade used cars, parts and appliances and where help or situations may be secured at a nominal cost.

LOGAN five-pass. touring car, 35 H. P., excellent condition; $250 cash. Address WOODWARD MACHINERY CO., 621 Main St., Cincinnati, Ohio.

FORD OWNERS—Save that rear axle. Protect your car from axle breakage, gear stripping, etc., by getting our rear axle truss, or support. Re-inforce your car so as to be able to carry five passengers in the rear seat with safety. Can be applied in two minutes. Write for circulars and complete information. Price $3.25 express prepaid. Do it now. Satisfaction guaranteed. SUNVOLD & LARSON, Sacred Heart, Minn.

FOR SALE—Locomobile, 1911 model; horsepower, 30.6; maker, Locomobile Co. In good order. Not been used this year. Cost $5,000.00. Highest offer gets it. In perfect running order. Address M. W. ADAMS, Chatham, N. J., where car can be seen.

FOR SALE—Four automobile trucks. Grout, $400, 35 H. P., 4-cylinder, with magneto engine, top over driver and express body, tires in good condition. McIntyre 1½-ton truck, $600, has extra long express body, just painted, 4-cylinder motor, magneto, etc. Buick truck, $100, 2-cylinder, light delivery express body, newly painted. Reliance truck, 1-ton, $250, pneumatic tires, Gaf headlight, newly painted. Inter-State roadster, $800, double rumble seat in rear. Removable rims, electric lights, all fully equipped, new tires. HARRIS'S GARAGE, Easthampton, Mass.

MAILING LISTS—Automobile owners, any State, 5,000 names, $2.50; also chauffeurs, dealers, etc. OWNERS AUTO LIST COMPANY, Albany, N. Y.

WANTED—An experienced automobile accessory salesman to take charge of selling force of one of the best known accessory manufacturers in the market. Must have executive ability and be able to produce results. State experience and salary. BOX 208, care Motor World.

WANTED—General Manager, who has demonstrated his ability, and is in a position to buy controlling interest in $50,000.00 Motor Truck Co. This company has been manufacturing for three years, and has good agents. The trucks are giving entire satisfaction. The present manager compelled to give his attention to another interest. BOX 207, care Motor World.

EXCEPTIONAL TRADE—5 U. S. patents, 10,000 shares gold mining stock, 50 shares Pot and Urn Co., exchange for a touring car in running order and condition. CAMP, Spring Mount, Pa.

EXECUTIVE ENGINEER AND SALESMAN desires position in either service or selling departments. Ability proven; go anywhere, either factory or branch. BOX 206, Motor World.

AUTOMOBILE Cylinders Reground, new pistons and rings fitted. Garage air compressors. CAST IRON BRAZING CO., Manchester, N. H.

CADILLAC—Brand new four-passenger 1912, with top, windshield, seat covers, electric lights, electric starter. Regular price, $2,005, will sell for $1,800 on account of retiring from auto business. THOMAS STRACK, 1400 Myrtle Ave., Cincinnati, O.

WANTED—Position as chauffeur or private repairman, by Y. M. C. A. graduate, age 22; sober, handy man. G. OWEN, JR., Hardenburgh, N. Y.

FOR SALE—Touring car, 5-passenger, in excellent condition; price reasonable. Address P. O. Box 367, Springfield, Mass.

WANTED—5 pass. car, 1911 or 1912 model; will trade 20 acres fruit land, Palm Beach Co., Florida. Address, BEN. H. HARMS, Platteville, Wis.

FORD OWNERS, improve the appearance of your Fore Door Touring Car or Torpedo Runabout 50% for $3.25. Send postal for information. LINDELL AUTO SALES CO., 3444 Lindell Ave., St. Louis, Mo.

AUTOMOBILE Troubles and How to Remedy Them. Cloth $1.00; flexible leather $1.50. Automobile Driving Self Taught. Cloth $1.00; flexible leather $1.50. Guarantee with every book. Send for circular showing other Practical and Mechanical books. AUTO INFORMATION BUREAU, Box 704, North Tonawanda, N. Y.

BAKER ELECTRIC STANHOPE, just overhauled and painted, $390; will demonstrate. Victoria, $720; Newport Phaeton, $350. Telephone, Columbus 2830. BAKER VEHICLE COMPANY, 1798 Broadway, N. Y. City.

WE BOUGHT AT BARGAIN from bankrupt factory 500 fine mohair tops, $40.00 kind; will sell at $10.00 each cash, complete with curtains, covers and windshields. This price will move quick, so get your order in early. PURITAN MACHINE CO., 51-57 10th St., Detroit, Mich.

ONE new seven-passenger aluminum auto body complete with top; upholstering fine shape, color maroon. KNOWLTON WAREHOUSE CO., 93 Perry St., Buffalo, N. Y.

An ad. like this will cost you $1.50 for each insertion.

MR. DEALER:

By looking over these two pages weekly you will have placed at your disposal, a "market place" of the whole motor industry.

We will feature this Classified Advertising Department for the benefit of our readers who thereby will be able to exchange their purchasing or selling demands with

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For Sale—Wants—Exchange

15 cents per line of six words, cash with order: — In capitals, 25 cents per line —

A market place where Dealers, Jobbers and Manufacturers may buy, sell or trade used cars, parts and appliances and where help or situations may be secured at a nominal cost.

FOR SALE OR EXCHANGE, for automobile, not earlier than 1911 model, 40 ft. motorboat, 12 ft. beam, 2½ ft. draught, 6 ft. headroom cabin, sleeps four comfortably; toilet, wash basin, dory, 15 h. p. 2-cylinder Mianus motor; thoroughly equipped in every way, with full inventory; in commission; price, $800. Apply to E. SHUTTLEWORTH, 815 Vernon Ave., Long Island City, N. Y.

SEVEN passenger car, three months in use, 1911. $2,500, H. CLARK, 292 East 135th St., New York City.

ONE 1-ton 20 horse and one 2-ton 30 horse new auto trucks at a bargain. CEDAR RAPIDS AUTO WORKS, Cedar Rapids, Ia.

AUTOMOBILES—A. C. C. A. Prices Talk! Every make. Every model. Hundreds runabouts, racy roadsters, five-seven passenger touring cars. $50 up. Guaranteed five years. Shipped Freight Prepaid! Write today for the largest Illustrated Catalog published! THE AUTOMOBILE AND CYCLE COMPANY OF AMERICA, Dept. I-N, 1769-1787 Broadway, New York City.

SALESMEN, one who is now visiting automobile trade or owners. Good money made on a very attractive proposition. STURDY MFG. CO., 2637 Michigan Ave., Chicago, Ill.

AGENTS WANTED — To handle the $1000 G. J. G. "Junior," racy, classy and specially designed chaseabout with 104-inch wheelbase, with a real 26 H. P. motor, Bosch magneto, Dorian remountable rims with 32 x 3½ tires, at a price of $1,000, which is a money-maker for the sales agent. Write for literature and discounts to G. J. G. MOTOR CAR COMPANY, White Plains, N. Y.

BROKEN CRANKSHAFTS, cylinders, crankcases, flywheels, gear teeth, pistons, perfectly welded and machined ready to replace. Guaranteed and references. Machinery up to 5 tons welded. ATLAS WELDING WORKS, 74-76-78 Irving St., Rahway, N. J.

LET us put a good top on your runabout for $14 or touring car for $27; satisfaction guaranteed. BISON TRIMMING CO., Buffalo, N. Y.

EIGHTY up-to-date fore-poor five-passenger wood, solid one-piece bendings, automobile bodies, in color and filler. Wiill sell cheap. Write for particulars and price. Cause of sale, bodies left on hands on account of failure of concern. Write quick. THE SIDNEY MFG. CO., Sidney, Ohio.

AUTOMOBILE AGENTS—I want local agents in every county in the United States to handle a popular-priced line of automobiles; a good name and reputation for integrity counts more with us than money or experience; if you have $300 and can furnish bond you can procure the agency for our high-grade car and we will furnish you with demonstrator. For full particulars address R. C. LEWIS, Sales Manager, Box 55, Milwaukee, Wis.

CLIMATIC LINEN DUSTERS, direct to consumer, at regular wholesale price, $1.38 each. Featherweight silken raincoats, $4.50 each. Men's and women's; all sizes. Mention your dealer's name when ordering. CLIMATIC RAINCOAT COMPANY, 102 Fifth Ave., New York.

FOR SALE—Columbia electric landaulet; recently overhauled and in good condition. Complete with Edison Charging Board. Price reasonable. Inquire P. MALI, 73 Fifth Ave., New York City.

FOR SALE—Dealer in new and second-hand automobiles; Ford runabout, 4 cyl., 26 H. P., top, windshield, rumble seat. Maxwell runabout. Oldsmobile, 4 cyl., top, 5-passenger, and windshield. Rambler, 2 cyl., top, 5-passenger, and delivery body; all in good condition. F. B. ARDRIE, 21 Carnes St., W. Lynn, Mass. P. S.—Wanted—to buy 50 automobiles.

MAILING LISTS—750,000 auto owners. S. H. CARROLL, JR., Albany, N. Y.

FORD OWNERS—GET OUR CATALOG. AUTO PARTS CO., PROVIDENCE, R. I.

SCHEBLER CARBURETOR.
J. C. NICHOLS.
DIRECT FACTORY DISTRIBUTORS.
1673 B'way at 52d St., New York City.
Tel. 6161 Col.
Our new model L Carburetor with three speed adjustments, at half price by returning your old model Carburetor.

AUTOMOBILE WANTED
I WILL exchange Boston income property for used touring car, $500 to $3,000 value; will pay some cash if necessary. PITKIN, 209 Washington St., Suite 58, Boston, Mass.

FOR SALE AT REASONABLE PRICE.
One model D 1911 Chase Motor Truck. Overhauled by factory people, who advise it is in first class condition. For further details write. A. H. WINSLOW, Bennington, Vt.

MOHAIR—DUCK—CANVAS—TOPS
PEERLESS AUTO TOP DRESSING
restores the faded top to its original color. A leaking top is waterproofed with one coat. It does not stiffen or harden to break when the top is folded. Anyone can apply it. Sold all over the country by Garages and Supply Dealers. Price: 1 gallon can, $3.75; ½ gallon can, $1.90; ¼ gallon can, $1.00.
THE COLUMBUS VARNISH CO.,
Columbus, Ohio.

each other, be it help or situations wanted, or the buying of a second-hand car or the selling of an entire business.

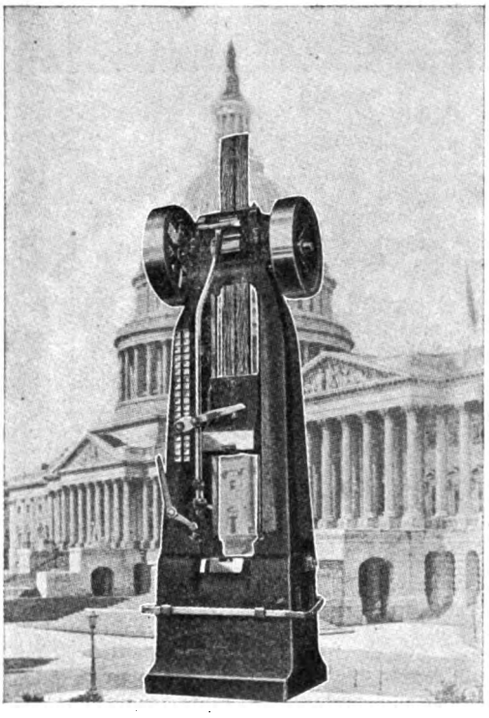
Of our total paid yearly subscribers of 8,000, there are 5,000 of you dealers who read Motor World weekly. For a very small investment you can get in touch with 5,000 men like yourself who are constantly keeping their eyes open to make a good purchase or a good sale.



An ad. like this will cost you 90c. for each insertion.

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Selected by the United States Government



Billings & Spencer
Improved Model C Drop Hammer

The quality of Billings & Spencer Drop Hammers has been recognized by the government.

Uncle Sam now uses 86 B. & S. Drop Hammers in his arsenals.

Among the many advantages of the B. & S. Drop Hammer is the fact that an improved board clamp makes unnecessary latch and connections at side for holding ram suspended.

Located at extreme top of machine—above the friction rolls—it is impossible for oil to get between clamps and boards.

Send for Descriptive Catalog

The Billings & Spencer Co.
HARTFORD, CONN.

THE MARK OF QUALITY B THE BILLINGS & SPENCER CO. HARTFORD

Acetylene Gas and Pure Air

This is the only mixture that should enter the cylinders of your engine through the medium of an engine starter.

If pure acetylene gas be injected into the cylinders of a gas engine, it is bound to foul and soot the spark plugs and reduce the efficiency of the engine.

The Niagara Self Starter

mixes acetylene gas with the proper proportion of pure air before injecting it into the cylinders of your engine.

That is why the Niagara Self Starter does not soot and foul the engine plugs—

That is why the Niagara Self Starter is the one self starter that you should sell.

Not only is the Niagara Self Starter built on the proper basic principle but its manufacture and the material used in its manufacture are absolutely right.

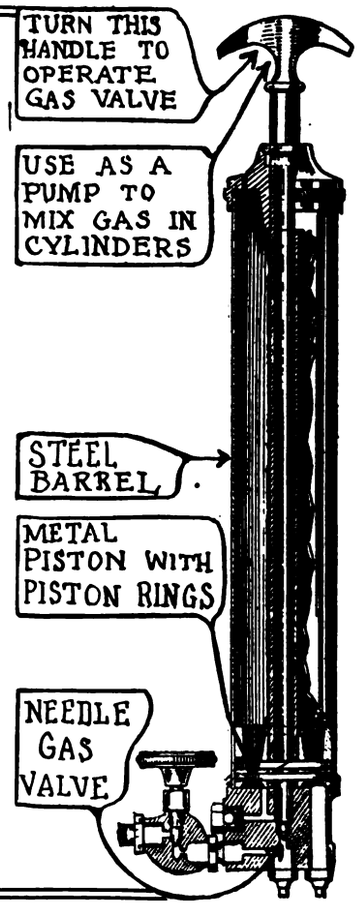
Leather washers are dispensed with because they are inefficient. In place of leather washers the compressor of the Niagara starter, shown herewith, is made of seamless drawn steel tubing with a cast iron piston and two cast iron piston rings.

When your car is worn out, take the Niagara starter off and put it on a new car. It will last forever.

We have a splendid proposition for dealers and a manufacturing proposition that is absolutely right.

Let us hear from you.

THE NIAGARA SALES COMPANY, Buffalo, New York



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1913



1913
Locomobile
Six "48"
Developing 82 H.P.

Locomobile

THE Locomobile Company, having long since attained a material lead in fundamentals, has been able to devote unlimited attention to new details and new features. As a result, the 1913 models offer more luxury and more comfort than can be found elsewhere.

For 1913 the Locomobile will be built in three sizes: the long stroke Six "48," developing 82 horse-power; the Little Six, developing over 60 horse-power, and the "30" four cylinder, developing 41 horse-power.

The Six "48" will be equipped with touring, torpedo, roadster, limousine and landaulet bodies. . . . . $5,000 to $6,100.

The Little Six will include all the above with the addition of berlines $4,300 to $5,550.

The "30" four cylinder will be in touring, torpedo and roadster models $3,600

In addition to new body designs which express unique ideas as well as the latest features of American and European practice, these cars include every feature contributive to the comfort and convenience of the passengers or the driver.

The long, sweeping straight line bodies are united to the bonnet by a well-shaped curved dash. The body surfaces are unmarred and unbroken by hinges or handles. Long wheel base, perfect spring suspension, absolute balance and ten-inch upholstery assure the maximum of comfort.

Ventilated glass fronts, integral with the curved dash, dynamos supplying all lights, air compressors for inflating the tires, Disco Starter for starting the motor, all are contributory factors for convenience. The equipment includes quick detachable, demountable rims.

THE LOCOMOBILE COMPANY OF AMERICA

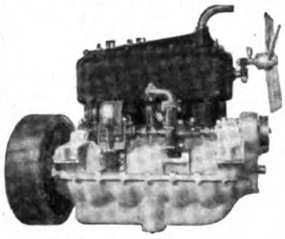
General Offices and Works: Bridgeport, Conn.

BRANCHES—New York, Chicago, Boston, Philadelphia, Pittsburgh, Washington, Baltimore, Atlanta, Minneapolis, San Francisco, Los Angeles, Oakland.

THE BEST BUILT CAR Locomobile IN AMERICA

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"CONTINENTAL"



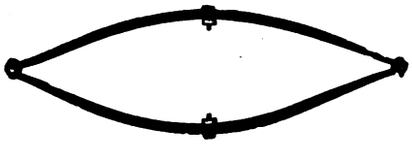
Best known motor in America. Look for the name "Continental" on the crank case. We have looked after the quality behind it.

4 and 6 Cylinders 20 to 60 H. P.

Continental Model "C" *Write for Booklets*

CONTINENTAL MOTOR MFG. COMPANY
Muskegon, Mich.

FACTORY REPRESENTATIVES;
K. F. Peterson, . 122 S. Michigan Blvd., Chicago
L. D. Bolton, ... 1810 Ford Bldg., Detroit



GUARANTEED AUTOMOBILE SPRINGS

Our plant is devoted exclusively to the manufacture of high quality springs. All work is oil tempered and warranted. Our circulars contain valuable information. Write.

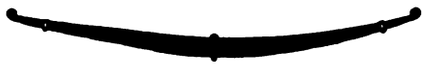
PENN SPRING WORKS
BALDWINSVILLE, N. Y.

PREST-O-LITE
The Light Universal

Ask for full information on Prest-O-Lite Gas Tanks, Prest-O-Tire Tubes, Prest-O-Tire Tanks, Prest-O-Carbon Remover, Prest-O-Welder, Prest-O-Starter and Prest-O-Liter.

The Prest-O-Lite Co., 287 E. South St. INDIANAPOLIS, IND.

ARE YOU in need of any additional help in any department of your business? Are you out of employment or looking for a better connection? Have you second-hand apparatus of any kind or do you want to buy second-hand material? Have you a factory site for sale or do you want to buy one? If so, use the Want and For Sale column of the Motor World. Seven words to the line, fifteen cents a line. Advertisements can be inserted over a number when it is desired and identity of the advertiser will be kept confidential.



Perfection Spring Company

SPECIALISTS IN

Spring Suspension

High Grade Only

Cleveland, Ohio

Send Us Your Inquiries When in the Market for

Sheet Metal Stampings

Estimates Cheerfully Furnished

The Bossert Company
UTICA, N. Y.

Woodworth Treads

will help you to increase your business while benefiting your customers. We will send any responsible dealer a pair on 30 days' trial Write now. Good Agents wanted for unoccupied territory.
LEATHER TIRE GOODS CO., Niagara Falls, N. Y.

DISCO

The Self Starter



GRANT-LEES GEARS

The Grant-Lees Machine Co.
Cleveland, Ohio

MANUFACTURERS AND DEALERS — The Typhoon signal, motor driven on the vibratory principle, has a deep, penetrating voice—different and more effective than any other.

A signal with the "scare note" effectively removed.

Consumes 50% less current — Lasts 100% longer
Makes 50% more noise — Costs 100% less
than any other electrically operated device.

TYPHOON SIGNAL COMPANY
1305 Michigan Avenue Chicago, Ill.



Stop Fussing with Tires

Cut out the everlasting repairing!—the agony of punctures, blowouts, and delays Enjoy unrestricted pleasure—always, always—with

DAYTON AIRLESS TIRES

Air-Free—Care-Free—cannot give out. They save any motorist hundreds of dollars. Send now for big FREE BOOK of money-saving, pleasure-making information you need now. You can't get it quick enough. Splendid dealers' proposition.

The Dayton Rubber Mfg. Co., 105 Kiser St., Dayton, O.

Absolutely Proof Against Every Trouble

It's Easy to Repair the Inner Tube

if you have the

Imperial Vulcanizer Repair Kit



PATENT PENDING

Nickel Plated

One ounce of gasoline and a little specially prepared rubber—with these and The Imperial you can have practically a

New Inner Tube in 15 Minutes

Price $3.50 Complete

At your dealer's, or sent by express.

Guaranteed to Satisfy

Address Dept. E

THE McGRAW TIRE & RUBBER CO.
East Palestine, Ohio

STOP PAYING GARAGE RENT

Why Not Own Your Own Garage?

We are Manufacturers and Builders of Fireproof Steel Garages of all sizes. Write for Catalogue and prices.

THE FIREPROOF GARAGE COMPANY
1226 Ridge Avenue Philadelphia, Pa.

Mosler Spit-Fire Are The Best

A. R. MOSLER & CO
163 WEST 23rd STREET
NEW YORK, N.Y.

AJAX TIRES

Guaranteed 5000 Miles

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General Offices: 1796 Broadway, New York City
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Magneto Plugs coax maximum power out of engine.
EMIL GROSSMAN COMPANY, Mfr., New York and Detroit



Tones down headlights for city driving and foggy nights an auto necessity. Price 75c. per pair. Sell like hot cakes. Dealers, secure the agency quick.

F. H. TOBIAS
1931 Broadway, New York

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THE SPRINGFIELD TOP
(Pat. 1895)
SPRINGFIELD METAL BODY CO.
366 Birnie Avenue, Springfield, Mass.

THE ATWATER-KENT IGNITION SYSTEM
ideal for your motor, write for information-booklet D
ATWATER-KENT MFG. WORKS
46 North Sixth St., Philadelphia, Pa.

Reo the Fifth
Final and crowning achievement of R. E. Olds, pioneer designer of autos. A standard size 30 to 38 horsepower four cylinder car of modern refinements priced for the present at only $1,055.
(38) R. M. OWEN & CO., General Sales Agents
REO MOTOR CAR CO., Lansing, Mich.

$495.00 METZ 22 H. P. MOTOR CAR
The most economical car you can buy at any price. The Metz will run from 28 to 32 miles on a gallon of gasoline, over 100 miles on a pint of lubricating oil, and from 8,000 to 10,000 miles on a set of tires. You can secure exclusive sale of these cars in your territory. Book "B" mailed free on request
METZ COMPANY, Waltham, Mass., U.S.A.

TRUFFAULT-HARTFORD SHOCK ABSORBER
HARTFORD SUSPENSION COMPANY, 154 Ray St., Jersey City, N. J.
EDW. V. HARTFORD, Pres.
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This name on Automobile Tires and Rubber Accessories signifies inherent qualities of material and workmanship that insure the maximum of service at the minimum of expense. (673)
The Goodyear Tire & Rubber Co., Akron, Ohio


MOTZ Cushion Tires
For Pleasure Cars and Light Delivery Cars
Send for Booklet 58
THE MOTZ TIRE AND RUBBER CO.
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1400 Race St., Philadelphia 2252 Euclid Ave., Cleveland
Standard Tire & Rubber Co., 104-106 Portland St., Boston
Distributors for New England States
A—Shows *double*, notched treads.
B—Shows undercut sides.
C—Shows slantwise bridges.
D—Shows absorbing means when passing over an obstruction.

The NIAGARA Self Starter
Is "As Dependable as Niagara"
Simple as It Is Efficient
Good Territory Open
THE NIAGARA SALES COMPANY
704 Main Street Buffalo, N. Y.

Weed Chains
The Great Anti-Skid DEVICE
Nine-tenths of all accidents to automobiles are caused by skidding or slipping.
Either you skid into the "other fellow" or the "other fellow" skids into you.
No matter how careful a driver you may be, you cannot prevent skidding or slipping on wet, muddy snow-covered roads or on icy, slippery greasy pavements unless you equip your car with Weed Chains.
Cannot Injure Tires
Because They Creep
An absolute necessity on both rear wheels and if you want to know what real steering steadiness means put them on the front wheels too.
For your own safety—for the safety of the public, fully equip your car with Weed Chains. Make it your business to get a set today.
Recommended and sold by all reputable dealers
Weed Chain Tire Grip Co.
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The Name "Weed" on Every Hook

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Why Don't You "Standardize"?
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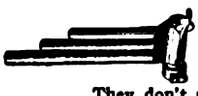
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That's what the INNERSHU accomplishes. It's a tough, durable, rubberized fabric formed permanently to tire shape. Ask for circular.
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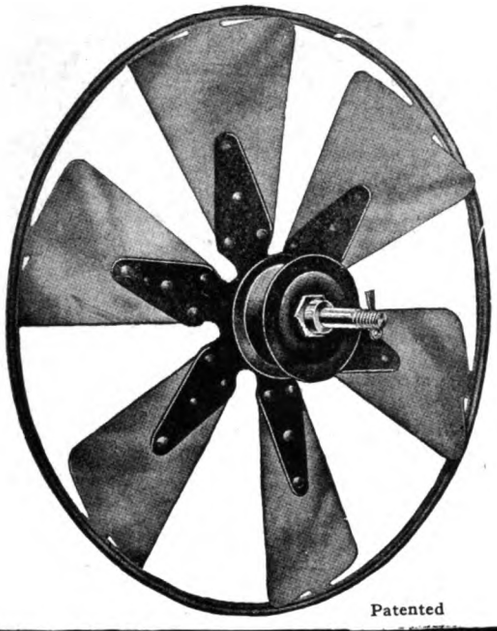
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They don't sell on sight, but
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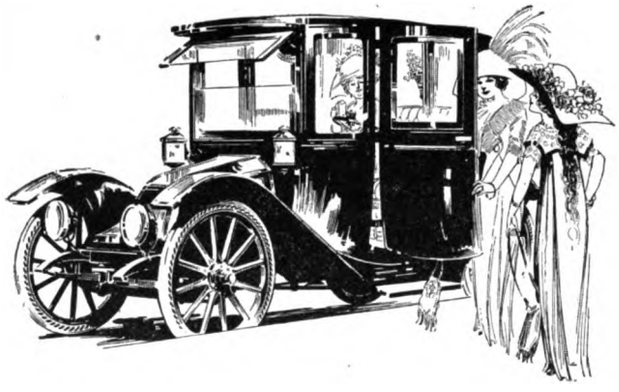
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Made of chrome steel of exclusive analysis, these bearings are free from blisters, air bubbles and other flaws that tend to weaken the structure or develop a variance of size, shape and weight.

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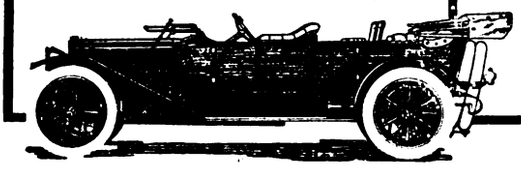
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KisselKar prices include full equipment—self-starter, top, windshield, demountable rims, speedometer, electric lighting equipment, shock absorbers, etc.

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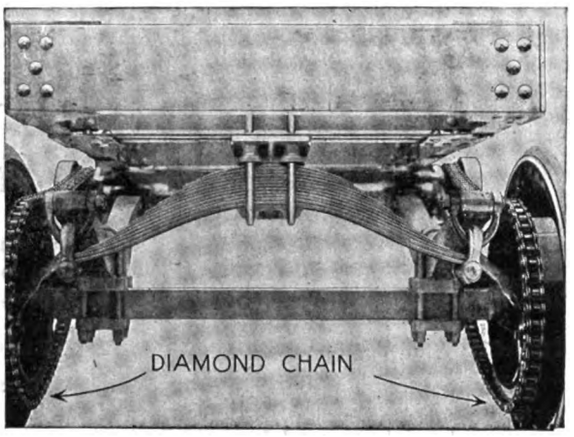
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Tires Inflated to the Right Pressure

He insists that this is tire economy and

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How do you know what pressure you have in your tires? A

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Ready for Delivery Now

Guaranteed Simple and Absolutely Accurate

Can be obtained from all tire manufacturers and the dealers, or

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Just as the Hanna self starter—the only 100% efficient self starter that does not foul or soot your plugs—was imitated by those who followed our lead so now is the price of the Valentine manifold starter being met.

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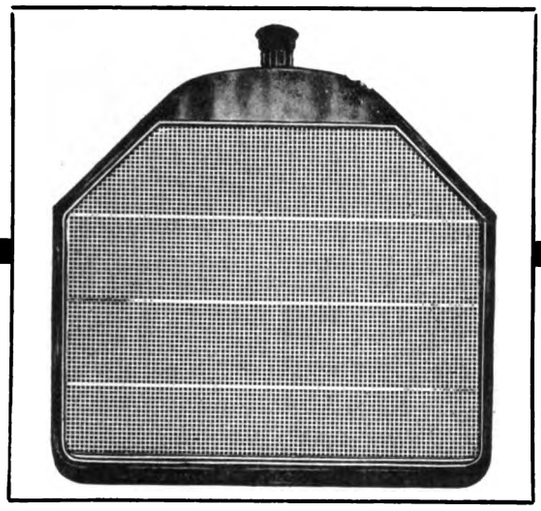
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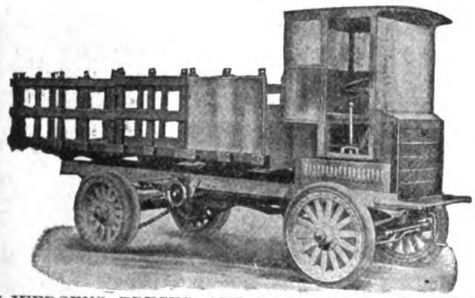
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ONE, TWO AND THREE TON CAPACITY



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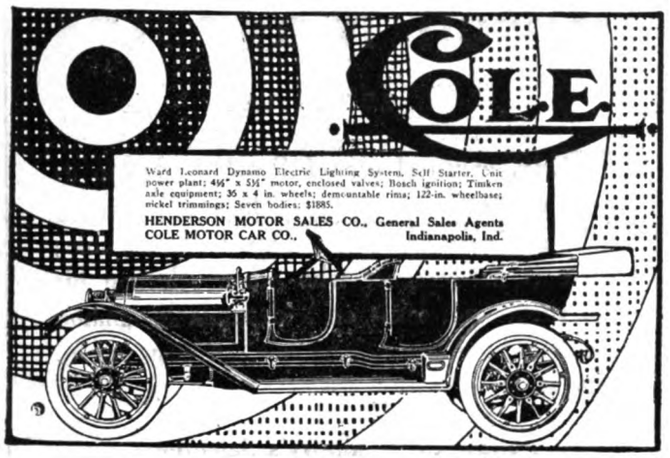
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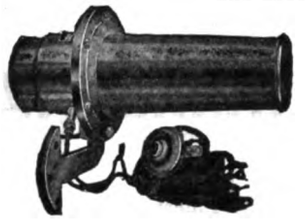


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Torpedo Type
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STAGGARD TREAD TIRES
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Pat. Sept. 15-22, '08

Motorists who use Republic Staggard Tread Tires will tell you that they—

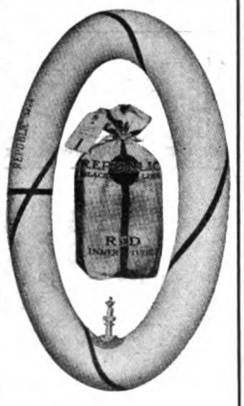
Prevent skidding, make quick starts and short stops easy.

Give double mileage because of the full-thickness tread under the studs.

Most Widely Imitated of All

We guarantee the Republic Black-Line Red Inner Tube to be as nearly perfect as a tube can be made—and is a fitting companion for the splendid Republic Staggard Tread.

The Best Tube Made



The Republic Rubber Co.
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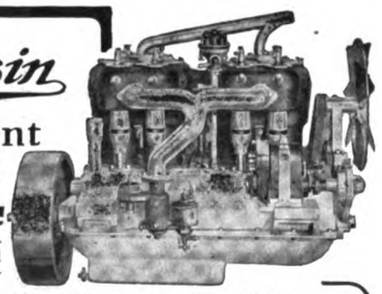
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Dealers: Wire or write for our special dealers' proposition—the biggest and most profitable thing in the accessory line.

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The Consistent Motors



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Large Bearings
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ALL 4 CYCLE—IN 5 TYPES—3 3-4 in. bore, 5 in. stroke, 4 cyl. 4 1-4 in. bore, 5 in. stroke, 4 cyl. 4 1-4 in. bore, 5 in. stroke, 6 cyl. 4 3-4 in. bore, 5 1-2 in. stroke, 4 cyl. 5 1-4 in. bore, 7 in. stroke, 4 cyl.

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United States Tires



ARE GOOD TIRES

B & L CASTER FRONT AXLE

Means to you as a car owner—SAFETY, EASY STEERING and PERFECT CONTROL. Agents should insist that their 1913 cars be equipped with it.

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Factory: Rockford, Illinois

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Electrically Self-Started and Lighted — Inter-State — Six Models 40 and 50 H. P. Fully Equipped

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Model 42—Roadster type—all with the splendid new en bloc motor, 4½ inch bore, 5½ inch stroke. 40 H.P..... $2400

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Fully equipped with top, windshield, speedometer, gasoline gauge, 36" wheels, demountable rims, and automatic tire pump.

All fully described in our Art Catalog. Send for one today.

Inter-State Automobile Co., Dept. O. **Muncie, Ind.**

Boston Branch: 153 Massachusetts Ave. Omaha Branch: 310 S. 18th St.

Price **$20** Without Cylinder Attachments

"The Crankless" STARTER

By adding an injector and cylinder attachments the crankless starter becomes absolutely perfect—100% efficient. For 4 cylinders the extra attachment costs $10, for 6 cylinders, $15.

Guaranteed by our 40 years standing and reputation.

COX BRASS MFG. CO. Established 1872 **Albany, New York**



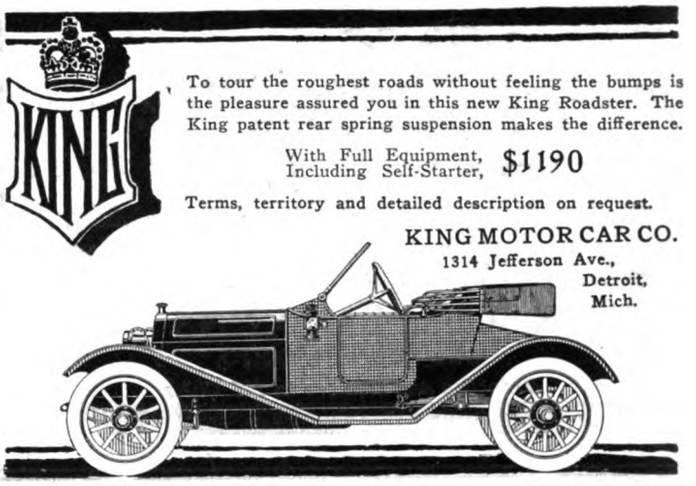
The Car THAT HOLDS THE CONFIDENCE OF ALL Glide

36-42 H. P. Complete Equipment $1550.00

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To tour the roughest roads without feeling the bumps is the pleasure assured you in this new King Roadster. The King patent rear spring suspension makes the difference.

With Full Equipment, Including Self-Starter, $1190

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OF QUALITY

FOR MOTOR TRUCKS

Jencick Motor Corporation

PORTCHESTER, N. Y.

"AC"

This name stands for efficiency in

SPARK PLUGS

Used as standard equipment by eighty-one manufacturers.

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are the least likely to require changing, and afford the best means of tire changing when required.



The Firestone Tire & Rubber Co., Akron, Ohio

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The first American Car to adopt the Silent Knight Motor—the engine used by Daimler, Mercedes, Panhard and Minerva.

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The *Pioneer* Moderate Priced Six-Cylinder Car

HAVERS SIX — HAVERS MOTOR CAR CO.

Havers Self-Starting "Six-44"



Price $1850

SPECIFICATIONS TALK—Six-cylinder Motor, 4-cycle long-stroke type; 44 H. P.; Bosch Magneto; dual system; Model "C" Stromberg Carburetor. 122-inch wheel-base; 36x4-inch wheels; self starter. Springs, semi-elliptic front, platform suspension, rear; rear axle, full floating type.

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4 and 6 Cylinder Motors
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4 Speeds Forward
Self-Starting
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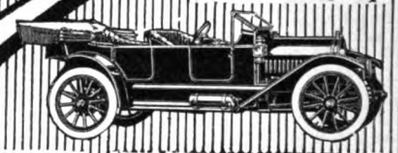
4-30	$1700 $1750	4-40	$2200 $2250	6-50	$2800 $2850	6-60	$3200 $3300

Agents wanted in open territory. Write today.

KLINE MOTOR CAR CORPORATION, York, Pa.
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No hill too steep
No sand too deep



MODEL 52	$1800.	
" 45	$1650.	
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5 Ton ALCO Truck Chassis
3½ Ton ALCO Truck Chassis

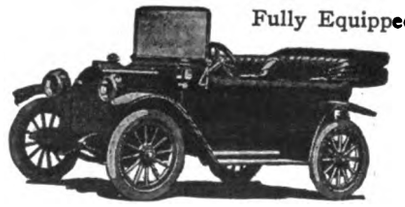
At the American Locomotive Company's Service Building, 614 Jackson Avenue, Long Island City, New York, August 13, 1912, at 11 o'clock A. M., the undersigned will offer for sale and sell at public auction to the highest bidder, one 5-ton Alco truck chassis and one 3½-ton Alco truck chassis for the account of the F. L. C. Martin Automobile Company, of Plainfield, New Jersey. These chassis may be inspected at the place of sale.

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1886 Broadway NEW YORK CITY
G. W. KEELER, Auctioneer, 12 Vesey St., New York City

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25 H. P. Long Stroke Motor

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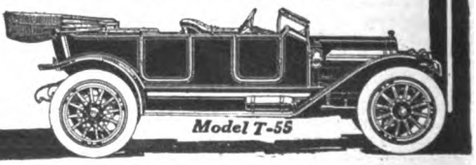
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Speedo

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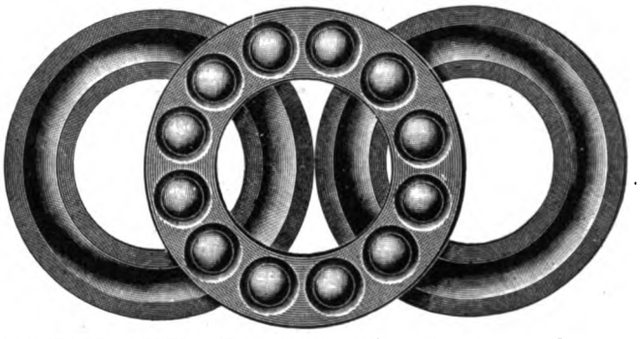
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will start any four-cycle engine of four or six cylinders. Turn on the switch—that's all.

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$3,000,000 in plants affording the most superior facilities for fine work; also hardening and treating of the finished product. Most thorough inspection and testing system. Our own laboratory.

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K·D
The Motor With the Sliding Crescent Valve

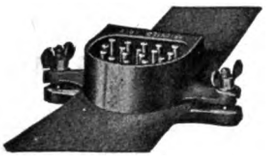
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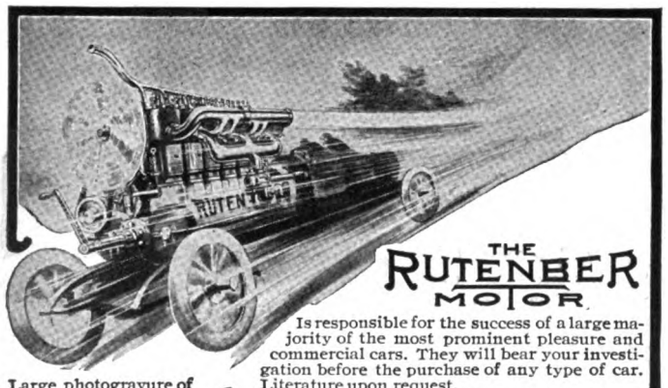
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The "INTERLOCK" Inner Tire is a complete inner tire, not an inner shoe,, and is now made endless so that does away with the troublesome end joint. It has Double Pressure, Lock Flaps, "locking the Interlock" into an inside tire which will hold independently of the outer casing being broken.

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We could build them cheaper
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LOOK FOR THE TRADE-MARK

Every foot of RAYBESTOS is stamped with our trade-mark. This protects you and your car. Be sure your brakes are lined with

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We want you to write for the Solar Catalog before you decide on your motor lamps, for this is the most complete line of lamps on the market. Solar Lamps have been preferred by most motorists for the past fourteen years because of their brilliancy, their style, their strength and their several exclusive advantages —their special short focus lead glass lens mirror reflectors—the patented double ray light projection (in the Solarclipse), giving two distinct fields of light, for city and country use—the new black finish, the only such finish that's proof against heat and moisture—and other features that other lamps lack.

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from special analysis steel.
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Seven Passenger, Fore-door Touring Car, fully equipped, less top, windshield and extra seats	$1800
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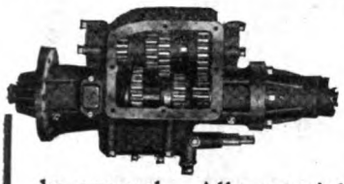
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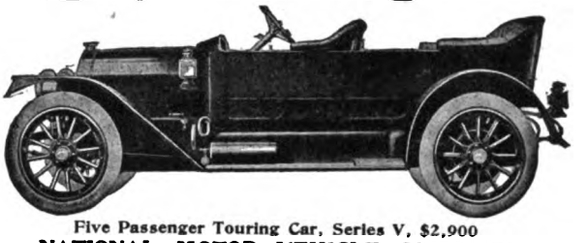


will help bring your car to the standard of efficiency that you are working for. Every gear shaft and bearing is made of nickel steel, heat treated and accurately ground. All material and workmanship is guaranteed. Will be glad to talk with you about them.

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A new type of six—a small one.

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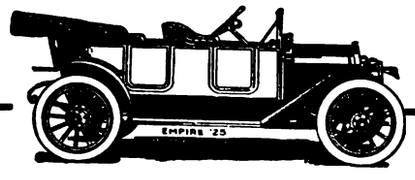
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This is the Big Brother of the Famous Empire Roadster and is a small edition of $5,000 cars.

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Motor 3¼ x 5½ inches; four cylinders; Bosch magneto; three speed sliding gears; tires 32 x 3½ inches; 106 inch wheelbase. Equipment includes windshield, gas headlights, generator, oil lamps, tools and tire repair kit.
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F. O. B. Detroit. Same power plant as World-Touring Car. Wheelbase, 86 inches. Equipment of top, windshield, gas lamps and generator, oil lamps, horn and tools.

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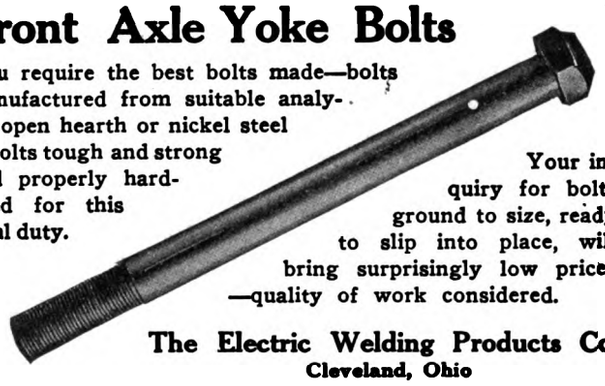
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For Pleasure Cars and Trucks

Repairing and truing old wheels a specialty. Experimental wheels a specialty. We furnish and apply any style demountable or detachable rim or tire.

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On your trip this summer bear in mind "The Waterway is The Only Way."

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fit any style or make of tires. The side rings are reversible, they curve outward on one side to fit a straight side tire, inward on the other to accommodate a clincher. Two turns of a nut unlocks the rim for demounting, two more turns locks the rim in place. Write for catalog 607, which explains fully.

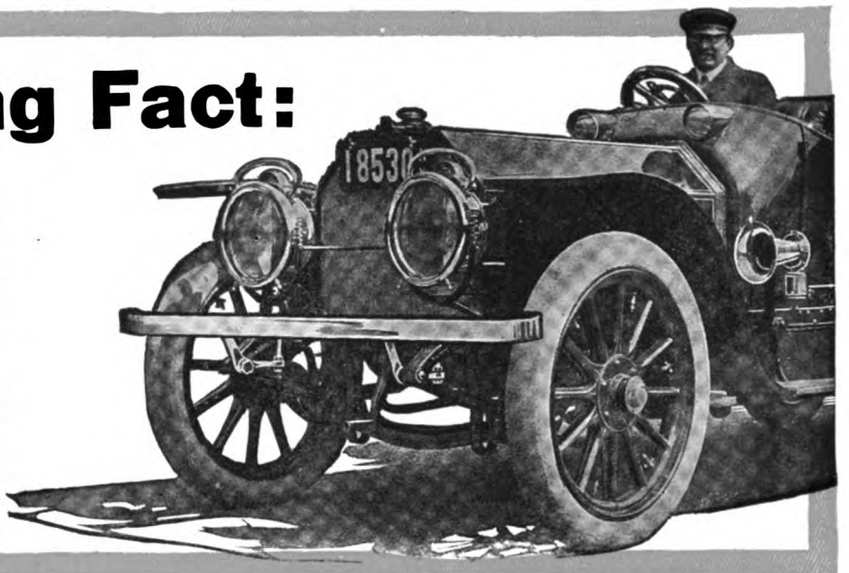


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"FEW motorists use any kind of a protective guard upon their cars; a large number are not even acquainted with the idea and advisability of such protection. Yet those who have equipped their cars with guard-rails of any kind would never take the risk of driving without them."



The CONOVER SAFE-GUARD

THE Conover Safe-Guard is a vast improvement over any other guard-rail on the market.

Its contact surface is FLAT—not round—and it is two inches or more in width.

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Best quality of steel heavily enameled in black, royal blue, French gray or maroon; bar 2 in. wide *(Any other color of enamel $5.00 extra)*	$15.00
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CONOVER

Safe-Guard

"Turns Accidents into Incidents"

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Studebaker

The All Important Question of Repair Parts

Convenience in getting repair parts—their cost when he does get them—are serious questions to every car owner. These considerations alone make the "assembled" car a dangerous experiment.

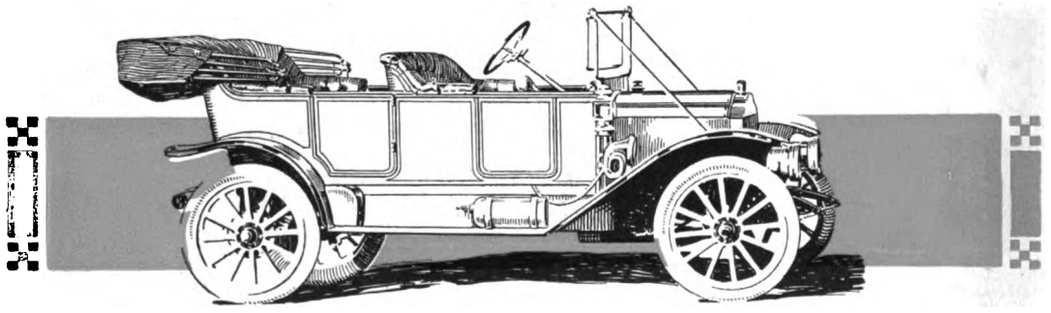
When he needs a new part, the owner of an "assembled" car has to wait for it—for days at least, perhaps weeks, perhaps months, and in addition to the annoyance and loss of time, face an expense bill out of all proportion to the actual value of the part.

Studebaker car owners have none of these troubles. Every car part is made in the Studebaker factories—made with automatic machinery which ensures absolute uniformity and precision and reduces cost to a minimum.

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The $800 Studebaker (Flanders) "20"

Equipped with Top, Windshield, Prest-O-Lite Tank and Speedometer, $885 f.o.b. Detroit

STUDEBAKER CARS

(Nickel Trimmed)

STUDEBAKER (FLANDERS) "20"		STUDEBAKER (E-M-F) "30"	
Touring Car	$800	Touring Car	$1100
Roadster	750	Detchable Demi-Tonneau	1100
Utility Car	800	Roadster	1100
Delivery Car	800		

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The Studebaker Corporation Detroit, Michigan

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A Trade Paper Giving the World's Motor News

Vol. XXXII
No. 7

New York, August 8, 1912

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Two dollars a year

GRAY & DAVIS



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Have Established a Standard by Which Other Lamps are Judged.

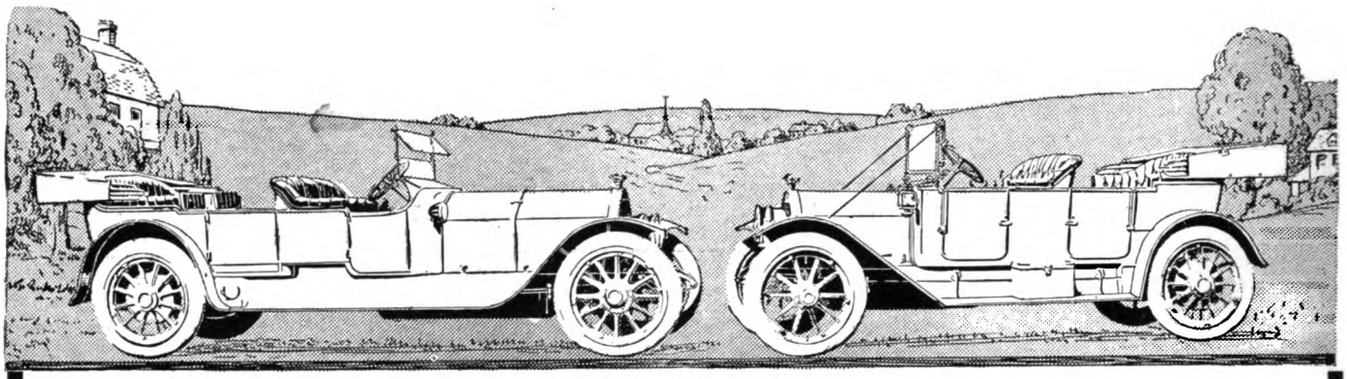
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"The Easiest Riding Car in the World"

Marmon Superiorities

THESE features of the Marmon are not merely "talking points." They have been proven. You know this, the trade knows it and every motor enthusiast knows it, for he remembers the amazing victories of the Marmon in the longest and most important races of the world against the finest cars produced in Europe or America. Every Marmon owner knows it from the magnificent service his Marmon is giving him in daily use.

Lubrication—By means of Marmon automobile force-feed direct to bearing surfaces through hollow shafts. Experts pronounce it the best system on any car. Records and service back up their verdict.

"T"-Head Motor—With extra large valves, effective cooling, ample ports for intake and exhaust, efficient carburetion, two spark dual ignition and long stroke—producing ample power for every contingency of the thronged city street, rough roads, mud, hills or the smooth, open stretch where its quiet, efficient operation is a delight.

Three Point Syspension.

Straight Line Shaft Drive.

Unit Transmission—combined with rear axle, giving extreme accessibility, even balance, simpler, stronger and cleaner.

Internal Expanding Brakes—Two sets on each rear wheel, giving 403 square inches of braking surface. An investigation board of engineers examining all the cars for their braking systems at one of the great automobiles shows placed the Marmon first. Any other unbiased expert will acknowledge their superiority.

Rear Axle of distinctive construction, the flanged ends of drivers bolted rigidly to hub plates of wheels, eliminating the possibility of loose or wobbling wheels and reducing friction.

Steering Equipment that insures the greatest degree of safety and the maximum of utility and convenience.

Accessibility of every unit and part. No car has ever been designed with so many conveniences for quick and easy adjustment of working parts.

Economy of tires, fuel, oil and upkeep is proven not only by Marmon records in racing but from letters from owners in all parts of the country, which will be sent you on request.

Luxury of Operation—In the Marmon's quiet, smooth-running, efficient operation, the motorist realizes the highest degree of comfort, combined with the assurance that every part can be relied upon for the greatest efficiency.

Marmon superiorities, of which we have outlined but a few above, backed by the Marmon Standard of Design, Inspection, Workmanship and Materials, make the Marmon not only "better to own" but "easier to sell." Wise Dealers who realize what the permanency of the Marmon account means, will appreciate the widening of opportunity by the addition of the Marmon Six to the Marmon line.

The New Marmon Six

48-80 H.P., 145" wheelbase, turns in forty foot street; self-starting, dynamo lighting, with body types to meet every requirement and corresponding equipment — $5000 to $6350.

Nordyke & Marmon Co.

(ESTABLISHED 1851)

INDIANAPOLIS, INDIANA

Sixty Years of Successful Manufacturing

New Series, Marmon "32"

32-40 H.P., 120" wheelbase, self-starting, dynamo lighting, with body types to meet every requirement and corresponding equipment—$2850 to $4100.

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If the Thermometer Registers That When You Go Driving You Can Keep Your Hands as Warm as That if You Use the



Just how warm your hands shall be this winter is dependent entirely upon your wishes if your car is equipped with a Warm Hand Wheel.

For the Warm Hand Wheel will make your steering wheel so hot that you can scarcely hold it or as cold as the temperature without. It may be regulated entirely within the wishes of the driver. This means that there is no necessity whatever of laying up your car during the winter for fear of getting cold.

The Warm Hand Wheel positively eliminates all terrors of zero weather because it keeps the hands and feet absolutely as warm in zero weather as they would be driving this evening.

And it does all this in a simple and inexpensive manner either by means of fresh air, preheated by the motor and circulated through a specially adapted metal steering wheel; or by means of a pair of electrically heated coils enclosed within the steering wheel and operated by the batteries or dynamo on your car.

Every Dealer Should Be a Booster for the Warm Hand Wheel

The general use of the Warm Hand Wheel means a great increase in the number of persons who will drive cars during zero weather.

If more people drive cars you dealers will sell more cars. Consequently, it's good business for you dealers to boost for a heated steering wheel.

We are in position to supply you or your customers with the Warm Hand Wheel, either the type using heated air or the one which is operated by electricity. There is no one single accessory that would be a greater sales stimulant than a heated steering wheel.

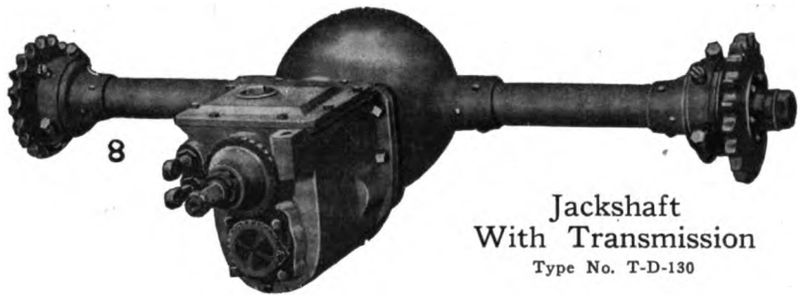
If you dealers insist upon having heated steering wheels on the cars you sell, the manufacturers will put them on those cars. If you meet with opposition on the part of the manufacturers, get in touch with us and we will help you out in the matter.

WARM HAND STEERING WHEEL CO., 527 Fifth Avenue, New York City

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EXPERIENCE — SHELDON — RIGHT DESIGN
FACILITIES — AXLES — RIGHT STEEL
"Made in the Largest Axle Factory in the World"

Axle Talk—No. XIV



Jackshaft
With Transmission
Type No. T-D-130

One Ton Truck Equipment

The truck equipment end of this business is growing—and even now we make seventy-five per cent of all the axles used on the domestic commercial truck output.

SHELDON I beam front axle run in six different sizes suitable for trucks from 500 to 10,000 pounds capacity.

Our T. D. 130, one ton equipment—the ideal jackshaft—with or without transmission—is ready for service and without experimenting on your part.

The material used has been given severe tests in actual service—the various parts are liberal in size and intended to "stand up" under hard usage.

As often reiterated in previous advertising, this plant, from the engineering department on down, is ready to follow your plans and specifications to a successful finish.

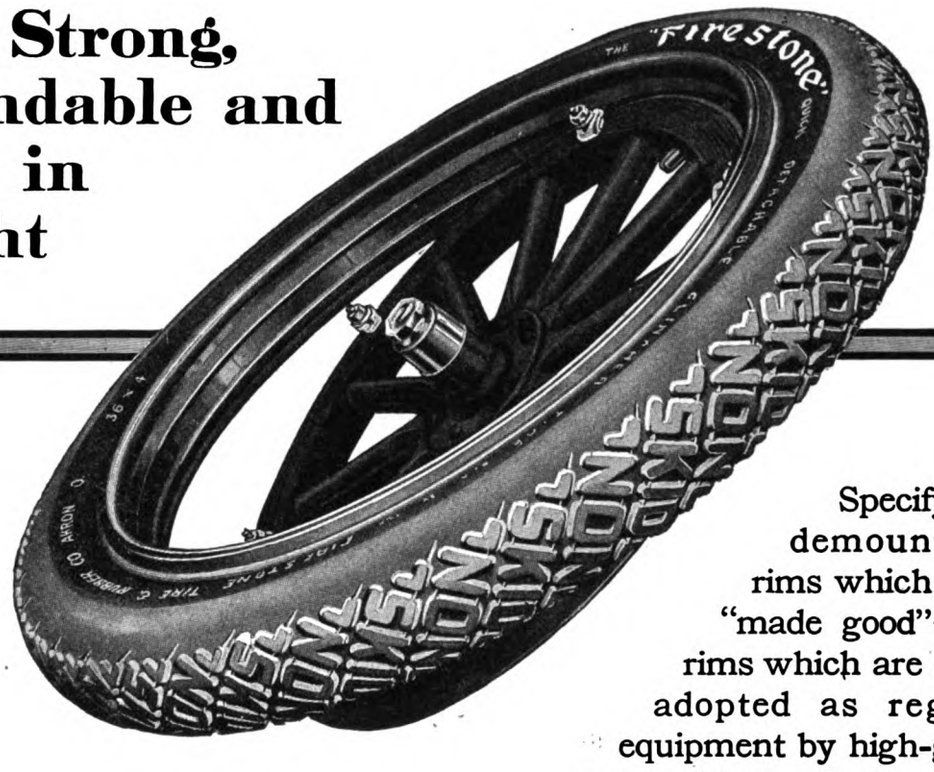
"In stock" or "to order" we have every facility to deliver on specified time, right products at right prices.

SHELDON AXLE COMPANY, Wilkes-Barre, Pa.

CHICAGO OFFICE—68 East 12th St. DETROIT OFFICE—1215 Woodward Ave.

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Sure, Strong, Dependable and Light in Weight



Specify the demountable rims which have "made good"—the rims which are being adopted as regular equipment by high-grade car builders. Demand the rims which alone have passed experiment to accomplishment.

Firestone

Quick-Detachable

Demountable Rims

For Tires of All Standard Types

Their unbroken, "no split" base makes them moisture-proof. Bearing support is continuous. No wedges to force them out of true. Mechanism is simple—no delicate parts to get out of adjustment or rust together. A wrench removes the rim—a screw-driver alone is needed to remove tire, whether rim is on or off wheel.

Designed and built by the world's greatest ***tire makers,*** they never fail to fulfill the tire user's expectation.

Service-Wise users demand, Trade-Wise Dealers Recommend Firestone Rims.

The Firestone Tire & Rubber Co.

"America's Largest Exclusive Tire & Rim Makers"

Akron, Ohio - - All Principal Cities

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First of The Five Leaders

to Meet the Demand for a High-Grade Little Six at Popular Price is Premier

The Premier

Is America's Greatest Touring Car. Proven beyond doubt year after year with greater public demonstrations than those of all the other cars put together. Premier has never lost a car in any of the great endurance runs of the country—a record unapproached by any of its competitors.

In the famous "Ocean-to-Ocean" Tour, twelve Premier cars started and twelve Premier cars, all being driven by their owners, finished without mechanical difficulty. The wonder of this trip being that all of these Premiers had seen from three months to three years' service.

Ninety per cent of Premier output is sold to the friends of the men who own them, and more than eighty-eight per cent of the original owners of Premier cars are still driving Premier cars.

For five years Premier has been building Sixes. Therefore, this New Little Six Premier is not an experiment. "The bugs have been whipped out." Why take the chance of selling the unproved car when the greatest Premier of all, the New Little Six, backed with a record which proves absolutely the car to be America's greatest touring car, can be purchased for $2600, equipped with a positive starter, tire inflator and electric lights.

Six Cylinder

The public wants—insists, and the high-grade business of the next year will be confined almost entirely to six-cylinder cars.

The Premier Little Six has a 4-inch bore with a 5-inch stroke, with the accepted type T-head motor.

Extremely large crank shaft with liberal bearings are used.

The Premier Little Six is a cool, sweet running, quiet and powerful motor developing on brake test, 48 horse power at 1400 revolutions. The principles of Premier design have been closely followed in this new model. It is a Premier.

Electric Lighted

The New Little Six Premier is electric lighted throughout by a special generator, a simple, uncomplicated, automatically-controlled, generating unit which has nothing whatever to do with the ignition system. Imported high tension, dual ignition continues regular equipment.

The lamps are electric head lights, bulls eyes in the dash and combination oil and electric light tail lamp, the white light being thrown across the license number.

Price $2600

For ten years the Premier organization have been building to a climax. They have always claimed and proved that there is more material and workmanship and less overhead in Premier price than in any car built in America. And it is a fact that the actual cost of building Premier is as great as any car of similar high grade; to this cost is added a legitimate manufacturer's profit and an overhead of but a fractional part of the average administrative, selling and carrying expense which figures into the list of the other four leading high-grade automobile manufacturers of the country. Many hundreds of dollars are represented in list price for which the buyer gets not a penny of real value.

This New Little Six Premier chassis represents the limit of actual workmanship and material, and the minimum of unproductive overhead and costly selling expense. This alone makes possible the list of $2600.

132-Inch Wheel Base

The 36-inch wheels carrying 4½-inch tires with 132-inch wheel base, efficient shock-absorbers, rubber bumpers, and wide scroll, three-quarter elliptic rear springs, 50-inch by 2¼-inch seven-leaf lower springs and 26-inch

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by 2¼-inch, six-leaf upper spring, both made out of the highest grade spring steel, make this LITTLE SIX PREMIER the easiest riding car in the country.

The NEW PREMIER is exceptionally deep and wide in the driver's compartment and is designed to care for the comfort of large men. The tonneau is also exceptionally large, making a roomy car comfortably seating five.

The leather used in the upholstering is of high grade hand-buffed leather, curled white hair alone being used in the upholstering, which is of exceptional depth and luxury, the divan cushions being ten inches deep.

Positive Starter

The NEW LITTLE SIX PREMIER carries the most positive starting device that has up to this time been developed It is of the pneumatic type sufficiently powerful to spin the motor at high speed, thereby producing sufficient pull to lift the gases in coldest weather. It is not necessary to run the car to charge the compression tank, which operation is practically noiseless.

This eliminates the greatest inconvenience of modern motoring. No longer is it necessary for a man to be of rugged physique or a trained athlete to drive an automobile, as the PREMIER LITTLE SIX starts by the pressure of a button. This means that this car will develop thousands of buyers who have been kept from the pleasure of automobiling because of an unwillingness to admit that they could not start a high-powered motor, or who did not care to run the risk of fractured limbs caused by back-firing motors.

Tire Inflator

Premier equipment of Firestone demountable rims where the extra tire is carried filled with air greatly reduced the inconvenience resulting from the punctured tire, but with the NEW LITTLE SIX PREMIER this is entirely eliminated by the addition of a tire inflator which has sufficient capacity to at all times supply compressed air for the inflation of your own or the other fellow's tires.

Luxurious Equipment

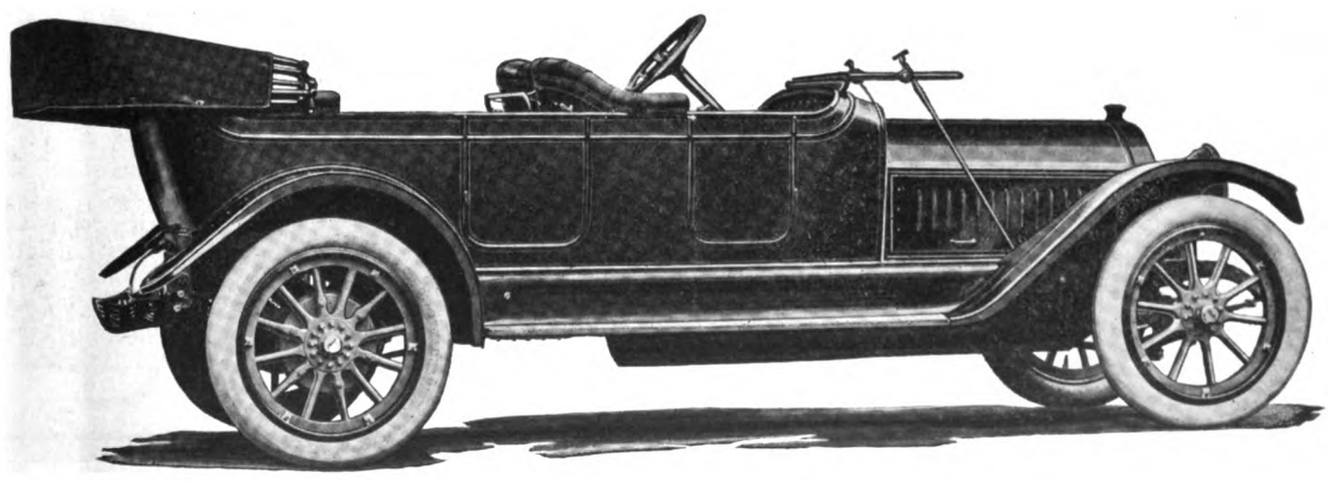
The PREMIER LITTLE SIX is a complete car. Its regular equipment includes, in addition to the starter, tire-inflator and electric lights, a speedometer giving the total season's mileage, a single trip mileage, which can be adjusted to any given mileage, the speed per hour and the grade upon which the car is running; foot rail, coat rail, jack, tire irons, which are on the rear, leaving the running boards absolutely clear; complete set of tools carried in a cabinet built in the dash; Firestone demountable rims with one extra rim; shock absorbers, recoil straps, etc., or in other words a complete car.

PREMIER

Six Cylinder

This Premier will be the big seller of the season. It has the value and reputation. Perhaps your territory is open. Our contract is a broad, liberal one which sees both sides. Better wire at once. Premier Motor Manufacturing Co., Indianapolis.

$2600
WITHOUT TOP AND WINDSHIELD



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JEFFERY-DEWITT CO. DETROIT, MICH.

Visible Spark Plug Cured Him



℞

DIAGNOSIS - - - Ignition Trouble.
PRESCRIPTION - One Set J-D Visible Spark Plugs.
FEE - - - - - - - $1.00 per plug—money back if not absolutely satisfied.

We Can Cure Your Ignition Troubles, Too

The new principle embodied in the ***J-D*** VISIBLE GAP SPARK PLUG enables you to locate and cure ignition trouble at a single glance. Through the port in the porcelain—**outside** the motor—you see if the spark is jumping the gap in the central electrode. No more need to hunt and test and fuss. If the spark jumps, but proper ignition fails to follow, then the plug must be foul or the carburetion faulty. If the spark does not jump, then trouble lies behind in magneto or wiring or coil or batteries. Knurled adjusting nut allows you to widen or close gap. Opened, it intensifies spark and cleans point automatically. Uses minimum current, makes timing of engine easy, and permits regulating of spark in any cylinder.

This is THE plug. It marks the biggest advance ever made in spark plug manufacture. We want to prove it to you. If your dealer has not yet put the J-D VISIBLE PLUG in stock, we will mail you as many as you want, prepaid, on receipt of price—just $1.00 per plug, the price of any good plug. Write and tell us the size wanted and make of car. And back of every plug you order we put our iron-clad guarantee **"absolute satisfaction or your money back."** Your word goes.

$1.00



ONE LOOK TELLS EVERYTHING

We make millions of plugs every year—nothing else—of finest materials, even importing the clays and other ingredients for our porcelain that defies heat.

When you write, ask us for our free book on ignition — a classic with motorists. It will make you master of your ignition system.

Jeffery-Dewitt Company

565 Butler Avenue **DETROIT, MICH.**

NEW YORK OFFICE: 1789 Broadway

Largest Manufacturers of Spark Plugs in the World

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TIMKEN

AXLES AND BEARINGS



Human Safety Comes First

Up over the rocks and ruts of the hills; down through the sand and mud of the valleys; veering round corners, spurting ahead—

Pleasure, satisfaction, a feeling of security—can only come with reliance on good axles and bearings.

Safety—to you and to those who ride in your car—is a prime consideration in a motor car. Nothing can compare in importance with human safety.

Good Axles are the Foundation of Motor-Car Safety

Whatever the speed or whatever the road, the axles must stand up to the stresses and shocks—

Not *most* of the time but *all*—over every foot of the trip.

Timken-Detroit Axles are doing this under thousands of cars built by more than a hundred noted American manufacturers.

There is every reason why Timken Axles should be good axles—and why they are.

First, the great Timken-Detroit organization, now over a thousand men, began its study of axles in the early days when there were no automobiles.

Second, all the energy, all the mind and all the heart of that organization are devoted to just one thing—the designing and building of "make good" axles for "make good" cars.

Third, Timken experience has been uniformly successful—with horse-drawn vehicles, in the early automobiles, under the first motor-trucks, and today, in all classes of cars.



The Timken Bearing with Cup Removed

Tapered rollers, revolving about a cone, sustain more load because they carry it along lines—not on points as balls do.

Good Bearings are the Heart of Safe Axles

One of the greatest reasons for the uniform success of Timken-Detroit Axles is the fact that they are equipped solely with Timken Tapered Roller Bearings.

Bearings that can carry greatest vertical load—that can, at the same time, sustain all the side pressure—

Bearings that offer greatest possible resistance to wear—and that can be easily adjusted to perfectly take up minute wear.

Bearings whose correctness of principle and whose practical efficiency are so widely recognized that they are used in the wheels and other places of the cars made by a large majority of car-builders in the United States and by many leading Foreign makers as well.

Add to your knowledge of your car by writing for the Timken Primers on axle and bearing anatomy

The whole story of Timken Axles and Bearings is told in simple, non-technical language in the Timken Primers, T-3 "On the Care and Character of Bearings" and T-4 "On the Anatomy of Automobile Axles." They'll give you a new grasp of a vital, interesting subject and a new understanding of your car.

THE TIMKEN-DETROIT AXLE CO., DETROIT, MICH.
THE TIMKEN ROLLER BEARING CO., CANTON, OHIO

For more than 14 years the Timken Roller Bearing Axle (made at Canton, O.) has been giving satisfactory service in horse-drawn vehicles.

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Hook up with COLE

How can you ever make money in the automobile business if you don't hook up with a big live organization which can give you a full line of the right cars at the right price—the cars your trade demands?

YOU have said to yourself time and again: "If I could only get a line that would meet the demands of all my prospects, whether the customer asks for a small, a medium, or a large size car—if I could get a thoroughly *good* car which I could sell at a profit and at a reasonable price—if this car came in a full line of models so that there would never be any danger of a prospect getting away from me *because I could not supply him with what he wanted*—if I could "hook up" with a factory which would give me what I want when I want it—if these cars that I speak of were really self-starting, equipped with the Delco electric lighting, starting and ignition system—and constructed out of nothing but the most *standard* parts, so that my profits would not be frittered away in free repair service to my users, and if the people who make these cars were absolutely gilt edge and already a success—*then I would not hesitate to stay in the automobile business*, for it is a fascinating business, and if I had a line of cars such as I describe, it would be a decidedly *profitable* business."

If your manufacturer does not give you *real* co-operation he is blocking your success. Part of the co-operation he *should* give you is *a full line of cars*. The Cole will come in three sizes this next season—a Standard Four, a Junior Cole and a 132-inch wheel base Six. This is *real* co-operation. You know what it will mean in sales cinched which last year got away from you. Take no chances. Fish with the Cole Triple Hook—not a bent pin. Go after every prospect and GET him. "Hook up" with Cole.

Here is what we are going to do for our dealers this season.

First, we are going to give you what you will consider the greatest selling line of automobiles in the history of the industry. You are going to be supported by the most extensive and most educational newspaper advertising campaign that the best experts obtainable can produce for you.

You are going to be able to put into the hands of every prospect the Cole Blue Book, which is in itself the most complete printed salesman ever sent out "on the road." It brings your prospect to you more than half sold. And we are not going to stop here. We are going to keep special trained, experienced men from our organization ready at any time to come into your territory, and co-operate with you on newspaper publicity and salesmanship.

Furthermore, we are not going to ask you to depend on your sales ability alone, no matter how good a salesman or how experienced a salesman you may be. We are going to place in your hands every thirty days a confidential Bulletin showing how every Cole representative in the field is turning his cars. This gives you approximately 1,000 salesmen on your floor—1,000 of the best salesmen on earth pulling for your bank account. This is characteristic Cole co-operation.

Hook up with COLE

Hook up with COLE

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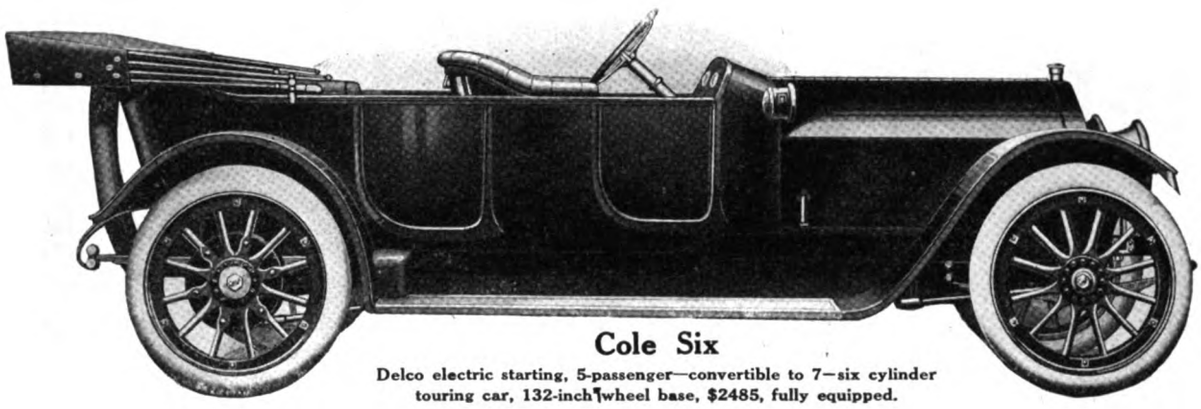
Hook up with COLE

Here they are—the new series Cole models—the most complete selling line in America

Nothing like this combination ever offered the dealer; a Standard Four, 122-inch wheel base; the Cole Six, 132-inch wheel base, and the Junior Cole, 116-inch wheel base. The new series will all be Delco electric self-starting, lighting and igniting.

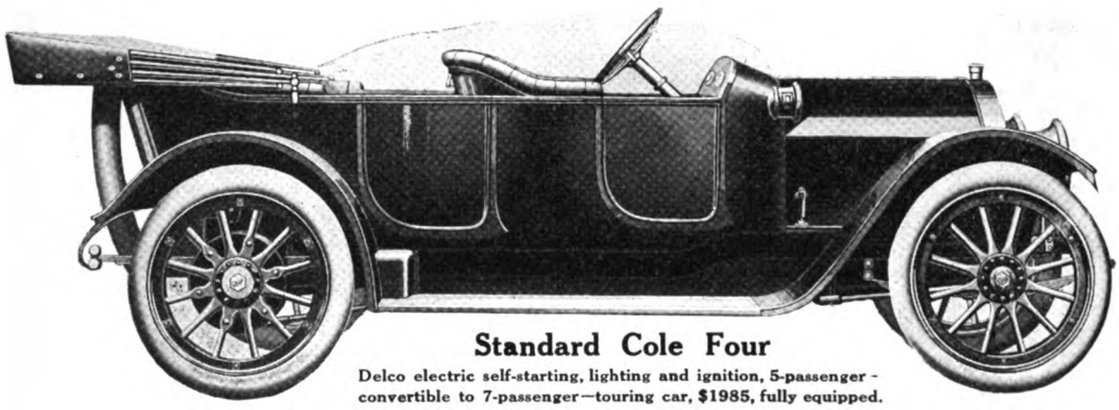
The design throughout has been slightly refined, but the old tried Cole principles of construction still hold—unit power plant, three point suspension, working parts enclosed, including valves, no grease cups on motor, Timken full floating rear axle, Timken front axle and bearings, demountable rims part of regular equipment, long wheel base and guaranteed non-breakable springs.

The following improvements have been adopted: Delco starting, lighting and ignition system, sight oil feed, speedometer on dash, slightly more sprawl room in the tonneau, running boards cleared and lengthened, gasoline automatic pressure feed tank, and tire rack in rear.



Cole Six

Delco electric starting, 5-passenger—convertible to 7—six cylinder touring car, 132-inch wheel base, $2485, fully equipped.



Standard Cole Four

Delco electric self-starting, lighting and ignition, 5-passenger—convertible to 7-passenger—touring car, $1985, fully equipped.

Junior Cole $1685

This car is identical with the Standard Four shown above, except in dimensions. Its size throughout is proportionate to its wheel base—116 inches. Delco electric starting, lighting and ignition as regular equipment—complete, $1685.

Write today for our 64-page automobile education. Put the best brains in the automobile business pulling for your bank account—you will never hook up with a mechanical "lemon" after you have read the Cole Blue Book. This book is not confined to information about the Cole. It handles the subject of automobile construction in a broad, truthful way. Get this book—read it—and then if you are in open territory hook up with Cole. Quit fishing with a bent pin—**use the Cole Triple Hook.** The first step toward a bigger and more profitable year is to fill out the coupon and "fire it" in at once to the

USE THIS COUPON

Cole Motor Car Co., Indianapolis, Ind. (K)

I am an automobile dealer. If you have anything better than I am now handling it's up to you to show me. Without obligation on my part, send me immediately the Cole Blue Book and your special proposition.

Name and Address.....

.....

COLE MOTOR CAR COMPANY, Indianapolis, Ind.

There will be a General Sales Convention of automobile dealers at Indianapolis, October 8 and 9. Mr. J. J. Cole personally invites you. Such noted sales authorities as A. F. Sheldon, Elbert Hubbard, W. D. Nesbit and John Lee Mahin will talk to you on "Selling More Motor Cars."

Hook up with COLE

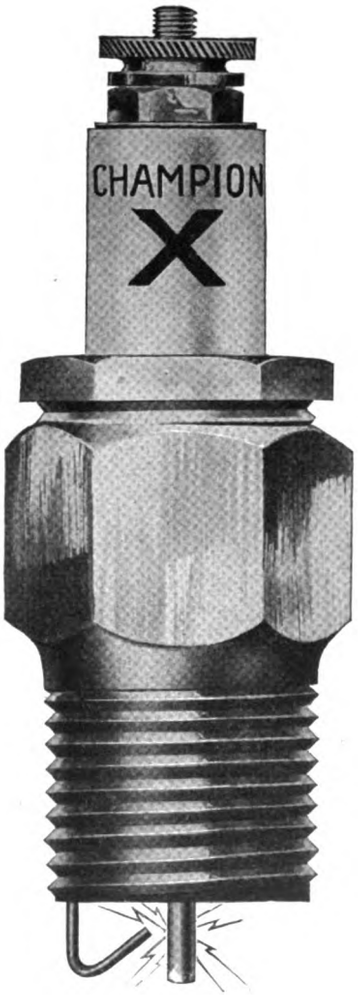
Hook up with COLE

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CHAMPION

TRADE-MARK

Champion Spark Plugs



CHAMPION X
75 Cents

The demand for Champion Spark Plugs for 1913 is practically universal. Manufacturers and dealers are deluging our sales offices with orders. We will far exceed our great 1912 record when we equipped 60 out of every 100 cars made with Champions.

We will set a new mark for all accessory manufacturers this year. We have a contract to supply one manufacturer with 4000 plugs daily. This is the largest contract ever given an accessory manufacturer. We have renewed practically every 1912 contract. This means that we maintain our position as the largest makers of spark plugs in the world. We will operate at full capacity every day to fill orders.

Giant manufacturers must insure the enormous outputs with the BEST accessories. A bad grade of plugs might ruin their tremendous businesses. They have chosen Champions almost without exception.

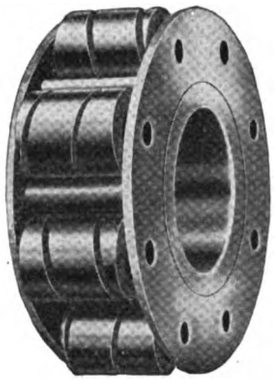
Dealers who find a preference for one type of Champions may exchange others. They come in a box bearing the "World" trade mark as above.

Manufacturers and dealers write today.

Champion Spark Plug Co.

Dept C **TOLEDO, OHIO**

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Treatment of Steel

STEEL LACKS THE GRAY MATTER necessary to back up physical weakness with a mental strength. Failure to measure up to required standards means a real deficiency and one which must be eliminated by intelligent handling.

SCIENTIFIC DOCTORING, or the treating of metals scientifically by the application of heat at known temperatures is a recent discovery. The very "pyrometer" necessary to measure high temperatures is of no long standing in its present accurate form, and only within the past couple of years has the "scleroscope" made possible the measuring by the average user of the results (or hardness) obtained.

STEEL CONTAINING CARBON in sufficient quantity and alloyed with certain other elements can be made doubly strong by successive heating and cooling at two or three different temperatures. For example, one analysis permits an increase in strength from 100,000 lbs. to 200,000 lbs. per square inch.

STEEL WITHOUT CARBON beyond a certain low percentage can have carbon added to its surface and soaked in to a certain definite depth. This is possible provided all the conditions surrounding the operation are accurately known. The carbonized surface then treated gives the necessary hardness for roller or ball bearing races.

SULPHUR CAUSES BRITTLENESS in steel. Yet to know that the amount of sulphur in every shipment received is below the specified figure requires constant chemical analysis. The Laboratory, therefore, is an essential part of every complete heat treating equipment.

CONTROL IS THE SECRET of that real success which can only insure uniform results. Chemical analysis, physical characteristics, methods, carbonizing mixtures, time and temperatures must all be known and accurately maintained. Repeated tests with detailed reports and the use of recording instruments cannot be avoided.

ALL THE APPARATUS as well as the methods necessary to give to the consumer a product which he may accept with every confidence in its superior qualities are found in the plant of the Hyatt Roller Bearing Company.

HYATT ROLLER BEARING CO.
DETROIT, MICHIGAN

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WHY DO THEY SMILE ?

IT'S A Knox



"IF YOU HAVE NEVER DRIVEN ONE UP A HILL YOU HAVE MISSED HALF THE SPORT OF MOTORING"

CATALOGUE MAILED ON REQUEST

KNOX AUTOMOBILE CO.

SPRINGFIELD, MASS.

NEW YORK BRANCHES CHICAGO

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"The Horn that's Made for the Discriminating"

TUTO HORN

THE TWO TONE HORN

100% vs. 10% Efficiency.

SERVICE results with the TUTO Horn have demonstrated conclusively that a mild warning signal, like that from the low note of the TUTO, will get the right of way 90% of the time and without offense.

¶ This leaves only 10% of the service for the louder note or emergency signal of the TUTO warning device.

¶ The providing of both the low and loud signals in the one TUTO Horn, and the operating of the same with the one button, gives 100% efficiency in service.

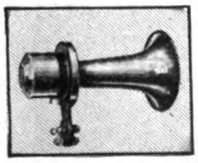
¶ Other electrical horns, having only one-extremely-loud-signal-note, are not actually required for more than ten signals out of every one hundred times that a warning is necessary.

¶ If this loud note is employed more often, the horn becomes a nuisance and defeats the purpose of the emergency signal by making undue noise and familiarizing the signal note so that little attention is paid to it.

¶ Thus, the one-loud-note electric horns are only 10% efficient when compared to the TUTO.

¶ The TUTO is the only two service horn—patented in the United States and abroad—and represents everything that can be desired in signalling efficiency, reliability and neatness.

¶ It is best for standard equipment and should be on every old car as well as on the new factory product.

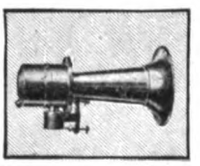


TUTO Horn, $25.00

The Dean Electric Co.

260 Taylor Avenue, Elyria, Ohio

"Look for Dean where Quality's seen"

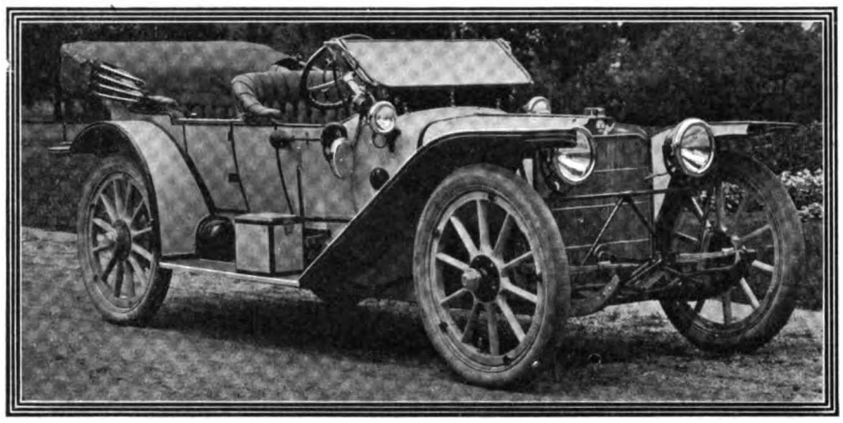


TUTO-ETTE $17.50

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NET SALES GAIN 194 PER CENT
over corresponding 11 months of previous year

NOT SILENT—but, "a sound so faint one can scarce distinguish it from silence."



The American Tourist, Fully Equipped, $2350

Four passengers. Motor, four cylinders, 4 1-2-inch bore, 5-inch stroke. Wheel base 118 inches. Tires, 37 x 4 inches; front and rear on Q. D. demountable rims,

$2350 includes regular equipment as follows: electric light dynamo outfit complete with generator and storage battery supplying five lamps; $50 Warner speedometer; fine plate glass wind shield; Disco self-starter; fine mohair top and curtains: high tension magneto and storage battery; one extra rim; shock absorber; robe rail; foot rest; horn; jack, tools and tire repair outfit.

Self Starting **AMERICAN UNDERSLUNG** *Electrically Lighted*

THE "American Underslung" is being adopted on all sides. Its design is the chief topic of conversation. It marks a transformation in automobiles. It forces the conventional "overhead" frame further and further into the past.

Eight years' results in the use of the underslung principle brings an universal demand in every territory. Unquestionable evidence is the increase in sales of 194 per cent in eleven months over the correspond-period of a year ago.

Here is a line of cars of superior construction. Their distinctive lines force inquiries. They are fundamentally different but not freaks. They abound in talking points for the dealer. We back them up with the most attractive sales contract of the season.

The low center of gravity *means safety* and *added comfort.*

The straight line drive means *less wasted power.*

The larger wheels mean *easier riding, tire economy* and *maximum road clearance.*

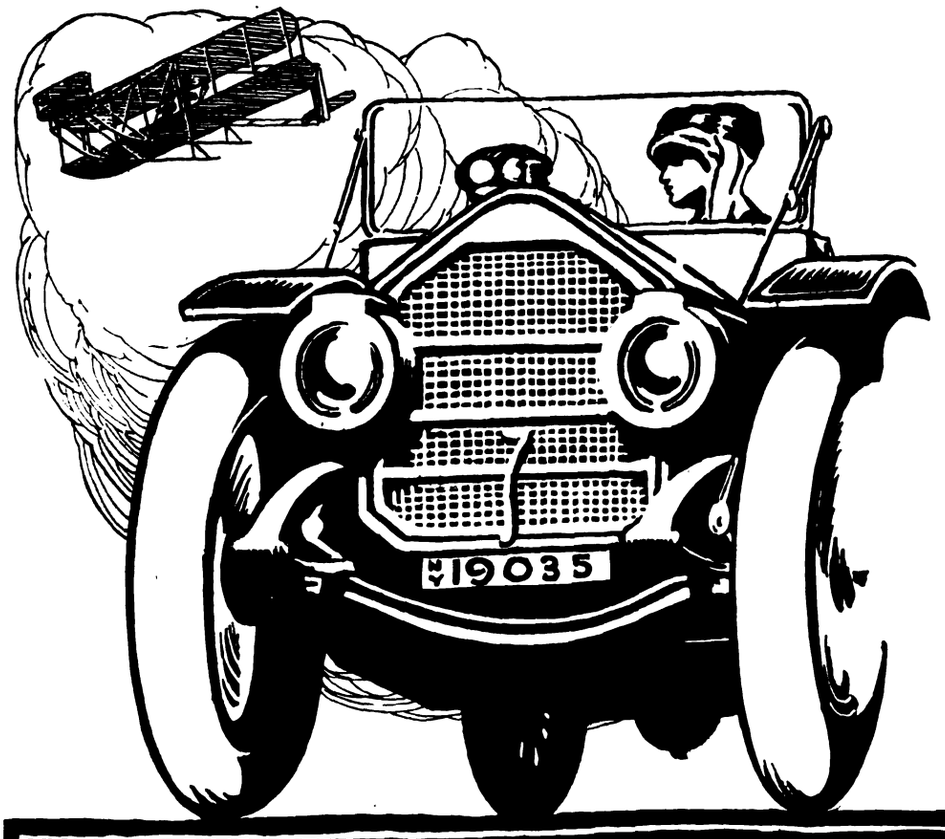
The underslung frame permits the direct and practical introduction of all these distinct advantages.

We have fully equipped each type. There are "no exras." We want you to investigage at once the "American Scout" at $1475, the "American Tourist" at $2350 and the "American Traveler" at $4500. Write today for a 1913 catalogue and simple treatise on the "Advantages of Underslung Construction." Address Dept. E.

American Motors Company

Indianapolis, Indiana

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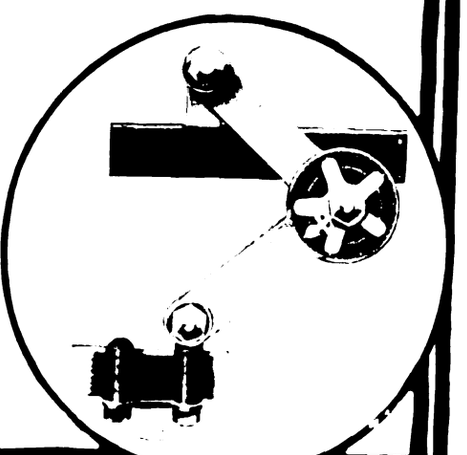


Truffault-Hartford SHOCK ABSORBER

¶ You can save your tires with the Truffault-Hartford Shock Absorber.

¶ When the wheels of a moving automobile leave the ground, the tire is subjected to an extreme ordeal in coming back to the ground. Jerk a knife blade at a revolving grindstone and you will get an idea of the result. The knife blade will be seared. The tire, too, is seared.

¶ Tires last much longer when the bounce is eliminated. Violent spring action causes the bounce. Truffault-Hartfords stop the violent spring action. That explains why there is more mileage in the tires of a Truffault-Hartford-equipped car.



HARTFORD SUSPENSION CO.

EDW. V. HARTFORD, President

Factory, 164 Bay Street **Jersey City, N. J.**

BRANCHES :

NEW YORK—1700 Broadway
NEW YORK—212-214 West 88th St.
JERSEY CITY—141-143 Morgan St.
BOSTON—319-325 Columbus Ave.
CHICAGO—1458 Michigan Ave.
DETROIT—803 Woodward Ave.
KANSAS CITY—1524 Grand Ave.
NEWARK—289 Halsey St.
PHILADELPHIA—1437 Vine St.
ASBURY PARK—Ocean and Third Aves.
BRETTON WOODS, N. H.—Bretton Woods Garage
INDIANAPOLIS—1448-50 No. Capital Blvd.

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70% MORE TIRE MILES

WIRE McCUE WHEELS

Here is absolute proof that wire wheels save tires

Boillot reduced the lead to a few seconds on the third round of the day and the thirteenth of the race itself, and led on the fourth by nearly twenty-five minutes, owing to bad tyre troubles happening to the Fiat. I should say here, by way of parenthesis, that the race was, indeed, a tyre contest, and Boillot's win was largely due to the excellent wearing qualities of the tyres he used. In fact, tyres lost the Fiats the race and nothing else, as these cars were smarter away and picked up and changed like lightning in comparison with their rivals. The American drivers and their mechanics evoked round after

The recent French Grand Prix over the Dieppe Course is proving conclusively that wire wheels increase tire life wonderfully.

It is commonly conceded that Boillot in his Peugeot defeated the Fiats because of their tire trouble. The London Daily Telegraph, in its review of the race, makes this statement:

> **"I should say here by way of parenthesis that the race was indeed a tire contest and Boillot's win was largely due to the excellent wearing qualities of the ——— tires he used. In fact, tires lost the Fiats the race and nothing else."**

It should be noted that the reason these tires stood up so well was that the winning Peugeot was equipped with wire wheels and throughout the entire course changed only about one-fifth as many tires as the Fiat, which was equipped with wooden wheels. Up until the night before the race the Fiat cars had expected to ride on wire wheels but on this night before the race they were induced to change over to wooden wheels, which fact absolutely lost them the race.

The Mathis, the well known English car in the Grand Prix, covered the entire 957 miles on wire wheels without making one single tire change.

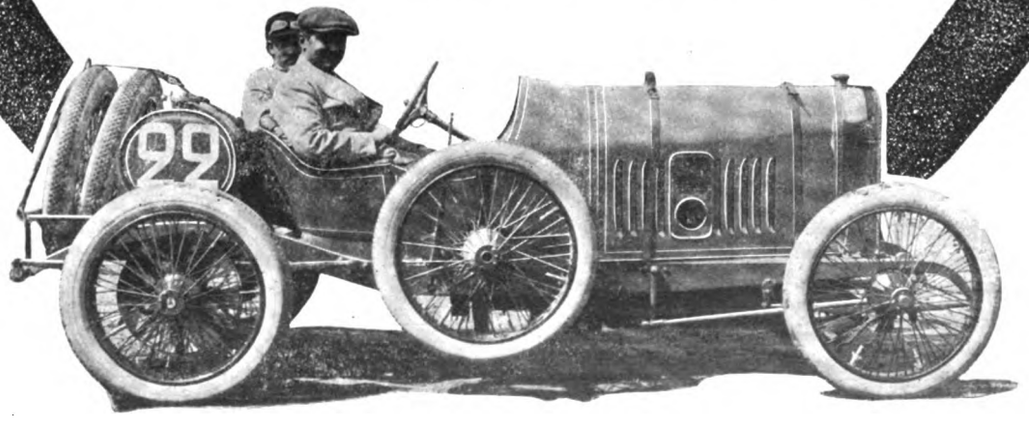
Wire wheels will be as popular in America in another year as they are abroad today—on the sheer merits of their tire saving ability. There is no stopping them.

McCue axles are so designed as to admit of the use of wire wheels or wooden wheels on the same spindle.

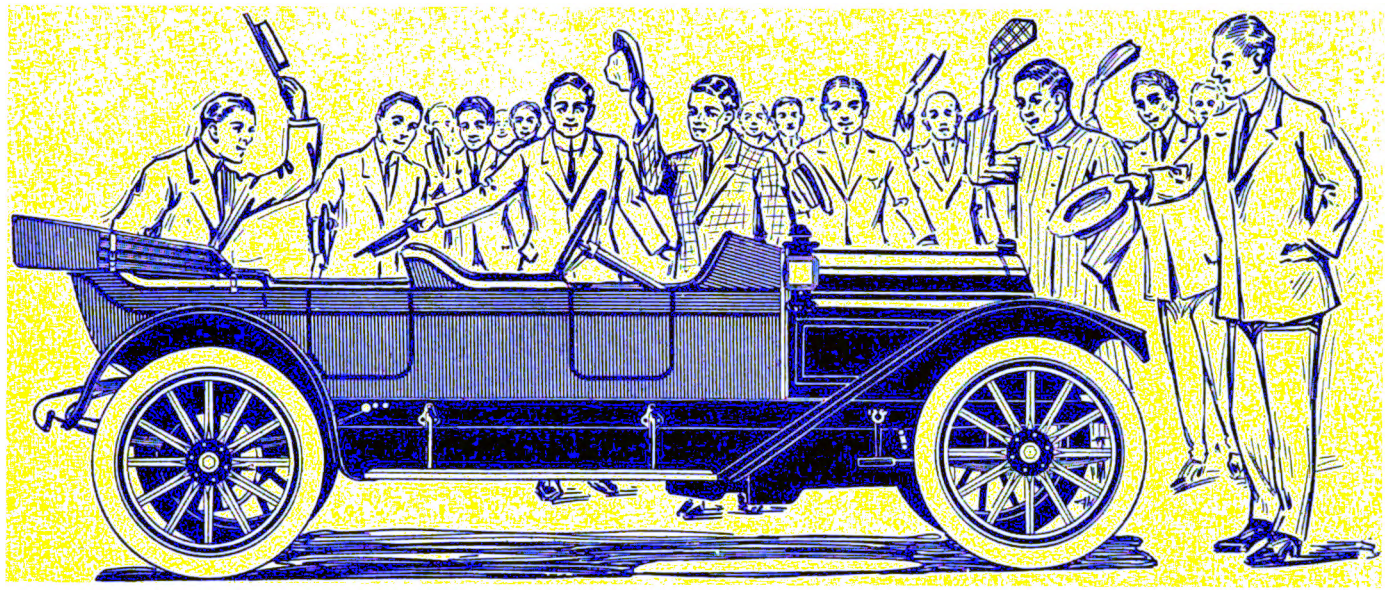
The use of wire wheels means greatly increased car sales for the dealer because the advent of wire wheels means almost double the life of tires. Double the life of tires means cutting the greatest single retarder of automobile sales—tire expense—almost squarely in two.

It is up to every dealer to boost for wire wheels—and don't wait until the other fellow has them on his car before you put in your demands upon the factory. Be the first man in your territory to offer wire wheels for sale. It will mean a lot of prestige to you and your car.

THE McCUE COMPANY, Buffalo, New York



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AGENTS

of ALL makes of cars take their hats off to the

Nyberg

THEY have got to recognize Nyberg superiority. Nyberg cars *command* respect. Competing agents know that to pit their car against a Nyberg—point for point—means to submit it to one of the most exacting tests conceivable.

And there's a reason. A Nyberg agent's clinching argument is telling why his car is so low in price in comparison with other makes. He loses no prestige trying to explain inflated value by resorting to the vague generality: "Our car is *worth* the difference asked for it." *He knows that the burden of proof is on any competitor who makes that statement.*

Works for the Agent by Selling Itself—and STAYING Sold

Run a Nyberg alongside any average car selling for half as much again. Compare them detail for detail—scrupulously, from tires to top. Compare the appearance, the ease of control, the accessibility. Compare motors, transmission, wheels, bodies.

The Deadly Parallel will convince you the Nyberg has no equal within hundreds of dollars of its price.

Fictitious prices don't fool a motor-wise public any longer. Nyberg cars are commonsense cars selling at a commonsense price. Sound dollar-for-dollar value is what they offer. *That is the prime reason they are self-selling and stay sold.* Furthermore, every Nyberg on the road is a silent salesman working *for* the Nyberg agent—not *against* him.

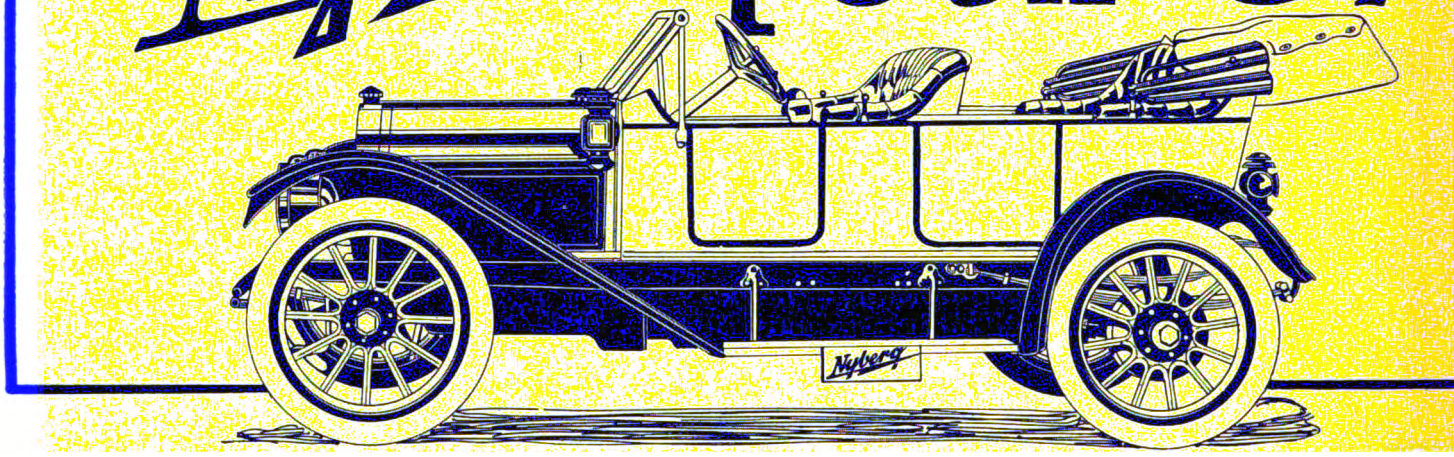
Thousands of people in your vicinity are now ready to buy a motor car. Fortunes are made in supplying the demand with the right car at the right price.

The advantages of handling Nyberg cars are that they cover a cost range which conforms to the demands of *all classes of users.* You are not limited to one circumscribed group of buyers, as is the man with a one-car agency. Anyone on the market for any kind of car, from a rakish roadster to a dependable delivery wagon, is a Nyberg prospect.

Already our capacity for 1913 is dangerously near to being oversold. Because of a change in selling policy, however, whereby we are desirous of distributing our 1913 product over a larger radius, a certain allotment of cars is being withheld subject to the option of *new* dealers. Here is your opportunity. Large capital is unnecessary. We are ready to do immediate business. Let us get together *now.* Read the next three pages, then *act.* Fill in the dealers' coupon—send it to us special delivery, or telegraph us. Applications attended to in the order received.

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Nyberg Four-37



SPECIFICATIONS

Motor: Four cylinder Rutenber motor, 3¼x5¼, offset cylinders, enclosed valves, unit power plant and 3-point suspension. **Transmission:** 3 speeds forward and reverse. Shafts mounted on annular ball bearings. Clutch: Multiple disc variety, Raybestos against steel, running in oil or dry, as desired. **Final drive:** Has two universal joints enclosed and packed in oil. **Rear Axle:** Full-floating, with pressed steel housing. Annular ball bearings used throughout, guaranteed against wear for two years. **Wheel Base:** 118 inches. **Tires:** 34"x4". **Equipment:** Top, glass front, Prest-O-Lite tank, five lamps, pump, tools, jack, horn and tire repair outfit.

$1295 FULLY EQUIPPED

The Car Competition Said Was "Impossible"

$1295.00 for a completely equipped five-passenger 37-horsepower Touring Car! A four-cylinder long stroke Rutenber motor, unit power plant, full-floating rear axle with pressed steel housing, a Warner transmission, Spicer universal joints, Schebler carburetor, a Remy magneto, 118-inch wheel base and 34x4 inch tires—all combined in one car selling at the unheard-of price of $1295.00! Do you wonder competition threw up its hands and cried: "It can't be done!" Do you wonder that the appearance of this car created such an uproar in the camp of cars selling at watered prices? Truly it was hot shot! *The old Fallacy that Big Price was an infallible indication of Big Value was blown to bits.*

And the Nyberg Four-37 is as handsome a car as you will meet in a day's drive. As much taste is expressed in its outward appearance as judgment is displayed under its hood—in its chassis construction. Comfortable seating capacity, silence in operation, ease of control, generous wheel base—all cater to the enjoyment of the driver and passengers.

The Car For Which There is a Universal Demand

$1,295.00 is the price limit today of more buyers looking for high-class cars than any other. The so-called middle-classes that considered an automobile a luxury five years ago, today regard it almost an economic necessity. Farmers who once attempted legislation against it, today are prepared to boom the motor market. They could get cars for less than $1,295.00 if they wanted them, *but they are vest-pocket models and a man can't take pride in an under-sized car that looks less value than he paid for it.* What the rank-and-file have really been waiting for is a high-class "regular" car at a reasonable price. In the Nyberg they have it. If you are one of the waiting thousands interested in a car of such unprecedented value, tear out the coupon on the last page and mail it to us for more complete information.

Dealers: The Nyberg Four-37 opens to you a virgin field, the field of the rank-and-file, never before entered by a strictly high-class car at the right price. There is absolutely no limit to your possibilities.

The profits lie where no one else has been. Opportunity knocks!

1913 Here's the Complete Line of Nyberg Cars for 1913

Nyberg Six-60

Two Passenger Roadster	$2000.00
Four Passenger Tourabout	2000.00
Five Passenger Touring Car	2000.00
Seven Passenger Touring Car	2100.00

Nyberg Six-45

Two Passenger Roadster	$1700.00
Four Passenger Tourabout	1750.00
Five Passenger Touring Car	1750.00
Seven Passenger Touring Car	1850.00

Nyberg Four-40

Two Passenger Roadster	$1400.00
Four Passenger Tourabout	1450.00
Five Passenger Touring Car	1450.00
Seven Passenger Touring Car	1650.00

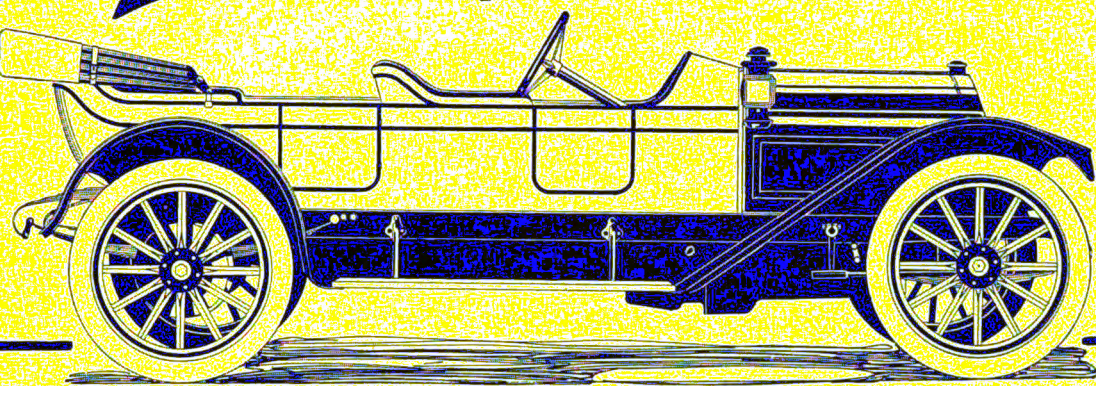
FOUR-37—Five Passenger Touring Car, $1295

Limousines, Landaulets, and Coupes to be had in most models. Rutenber Motors used exclusively with exception of one, 3¾x5.

Send for complete descriptive literature of Nyberg cars, supplied on four chassis in eight different body styles. Use the coupon on the last page.

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Nyberg SIX-45 SIX-60



SPECIFICATIONS

Nyberg Six-60

Motor: Six-cylinder Rutenber, 4¼"x 5¼"; offset cylinders, enclosed valves, unit power plant, and 3-point suspension. **Transmission:** Selective type sliding gear with 3 speeds forward and reverse. **Clutch:** Multiple Disc, Raybestos against steel, running dry or in oil, as desired. **Final Drive:** 2 large enclosed universal joints, running in oil. **Rear Axle:** Full-floating with pressed steel housing. Annular ball bearings used throughout. **Wheel Base:** 2-Passenger Roadster and 5-Passenger Touring Car, 126 inches; 4-Passenger Tourabout and 7-Passenger touring Car, 134 inches. **Tires:** 36x4 on all models except 7-Passenger Touring Car, which has 37x4½-inch tires. **Equipment:** Demountable rims, 5 lamps, gas tank, tools, jack, horn, pump, and tire repair outfit. Extra equipment $100 additional.

Nyberg Six-45

Motor: Six-cylinder, 3¼"x5". All other specifications same as Model Six-60.

$1750—$2000

ALL touring cars with four real doors; inside control; 6-cylinder self-starting long stroke motors; three-quarter elliptic springs, very long and easy riding; large, roomy bodies, with soft cushions; all working parts of car enclosed, eliminating all noise and vibration of the engine. Built along straight distinctive lines of the utmost beauty.

Dealers! You've Got to Meet the 1913 demand FOR "Sixes" WITH "Sixes"

You can't sell a man a "Four" if he *insists* on a "Six." The whole trend of automobile advancement points to 1913 as the big year of six-cylinder long stroke motors. What was considered in 1912 as more or less of an experiment has now become an accepted feature in motor car construction.

The man who knows most about motor cars best appreciates the unlimited measure of value offered him in Nyberg "Sixes."

The Nyberg "Six-45" and "Six-60" models are both of the same general design, the "Six-60" merely being proportionately larger. Extreme care has been taken in designing these cars to obtain grace, luxury and balance of lines. Both cars contain all the good points common to the whole line of Nyberg cars.

Sixes Which Bear Positive Proof to the Value of Specialization

The manufacturers of Nyberg cars believe that to do anything extremely well, you have got to center on that thing to the exclusion of everything else—*you have got to specialize. Every important part in Nyberg construction is made by master specialists.* Nyberg "Sixes" carry the highest grade six-cylinder motor specialists can produce—a Rutenber, with long stroke, offset cylinders cast separately and made of the best grade of gray iron; all working parts enclosed, making it the smoothest, most silent running motor on the market. *Its makers stake their reputation on it by guaranteeing it for life.* All models have unit power plant with three-point suspension.

The full-floating rear axle is made by a concern, recognized the world over as an authority on axle construction—The Hess Spring and Axle Company, established in business for over thirty-five years.

The axle is formed of one piece, encased in a pressed steel housing, equipped with annular ball bearings throughout, guaranteed against wear for two years.

The Warner transmission, the Schebler carburetor, the Remy magneto, and the springs used, are all made by specialists, *acknowledged leaders in their respective lines.*

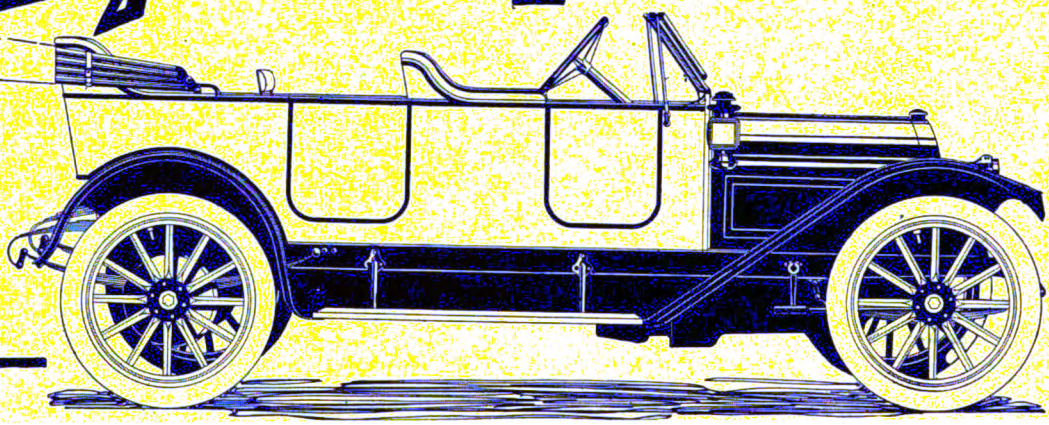
The message specialization carries to car-owners, as well as to dealers, is in the nature of a DOUBLE GUARANTEE: the guarantee of the specialist who manufactured each important part, and the further guarantee of the Nyberg Automobile Works.

EVERY PURCHASER OF A NYBERG CAR IS *DOUBLY PROTECTED.*

Dealers: The advantage of a complete line of Nyberg cars is that you can sell a man either a "Four" or a "Six" in any style, within a wide range of prices.

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Nyberg Four-40



SPECIFICATIONS

Motor: Four-cylinder Rutenber motor, 4¼"x5¼"; offset cylinders, enclosed valves, unit power plant and 3-point suspension. **Transmission:** 3 speeds forward and reverse. Shafts mounted on annular ball bearings. **Clutch:** Multiple disc variety, Raybestos against steel, running in oil or dry, as desired. **Final Drive:** Has two universal joints enclosed and packed in oil. **Rear Axle:** Full-floating, with pressed steel housing. Annular ball bearings used throughout, guaranteed against wear for two years. **Wheel Base:** Roadster and 5-Passenger Touring Car, 118 inches; Tourabout and 7-Passenger Touring Car, 126 inches. **Tires:** 36x4 inches on all models except 7-Passenger Touring Car, which has 37x4½ inch tires. **Equipment:** Demountable rims, 5 lamps, gas tank, pump, tools, jack, horn, and tire repair outfit. Extra equipment, $100 additional. Self-starter, $20 extra.

$1450 *4-1/4x5-1/4 40-horsepower Rutenber Motor, Unit Power Plant, Warner Transmission, Spicer Universal Joints, 118-inch Wheelbase, 36x4 Inch Tires.*

THE Nyberg Four-40 is the car that bridges the price gap between the Model Four-37 at $1295 and Models Six-45 and Six-60. It has all the good points found in the larger models. Almost the only difference is it contains a smaller motor, and does not boast as many of the non-essential "extras"—little luxuries—found in the handsomely appointed Six-45 and Six-60.

A Straight From the Shoulder Talk to Agents

Has it ever occurred to you why agents don't make money? *It's because they get the wrong car—the car they thought was all right, but wasn't.*

They may sell plenty of cars the first year; then comes motor trouble, transmission trouble, axle trouble, carburetor trouble, and *trouble due to the fact the customer found out he paid too much for his car.* That is a combination no agent can buck—and make money. Every customer is a dissatisfied customer. Hundreds of prospects they might have sold with a right car soon know it. Their reputation is at a discount—their business a failure.

The man who gets a Nyberg agency gets no pig in a poke. He goes into the automobile business with his eyes open, knowing that *the varnish and upholstery on a Nyberg conceal nothing but quality.*. He knows that a good motor, like the Rutenber, can never go wrong. He knows that a good transmission like a Warner, a good carbureter like a Schebler, a good rear axle like a Hess—are insurance against trouble. *He knows that every one of these parts, made by specialists, is a selling point—and will drive sales home.*

He knows that every Nyberg car that passes out of his hands is backed by a *double protective guarantee*—the guarantee of the part manufacturer and the guarantee of the Nyberg Automobile Works—with over twelve years of automobile experience as an asset. And he knows if Nyberg cars, in their individual parts and as a whole, were not so well made, were not to be positively relied upon in long periods of service, *they could not profitably be guaranteed.*

These are a few reasons a Nyberg agency is a business proposition—not a speculation. Nyberg agents build for the future. Remember if you don't sell the Nyberg you've got to compete with it. *And you can't afford to have as your competitor an agent for the Nyberg line.*

WE ARE GOING TO HELP YOU SELL NYBERG CARS. These four pages are but a part of a National advertising campaign which will create a nation-wide demand it's up to you to supply. Thousands of people in your territory have been holding out—waiting for just such a car as the Nyberg. *The car is right, the price is right, and the backing is right.* This vast business is *yours* for the asking. *Now* is the time to *act.* Tear off the attached coupon; fill it in and send it to us today.

COUPON

Nyberg Automobile Works
ANDERSON, INDIANA

Gentlemen: I desire further information concerning Nyberg cars.

Name .....

Address .....

.....

I am thinking of buying a car. [ ]

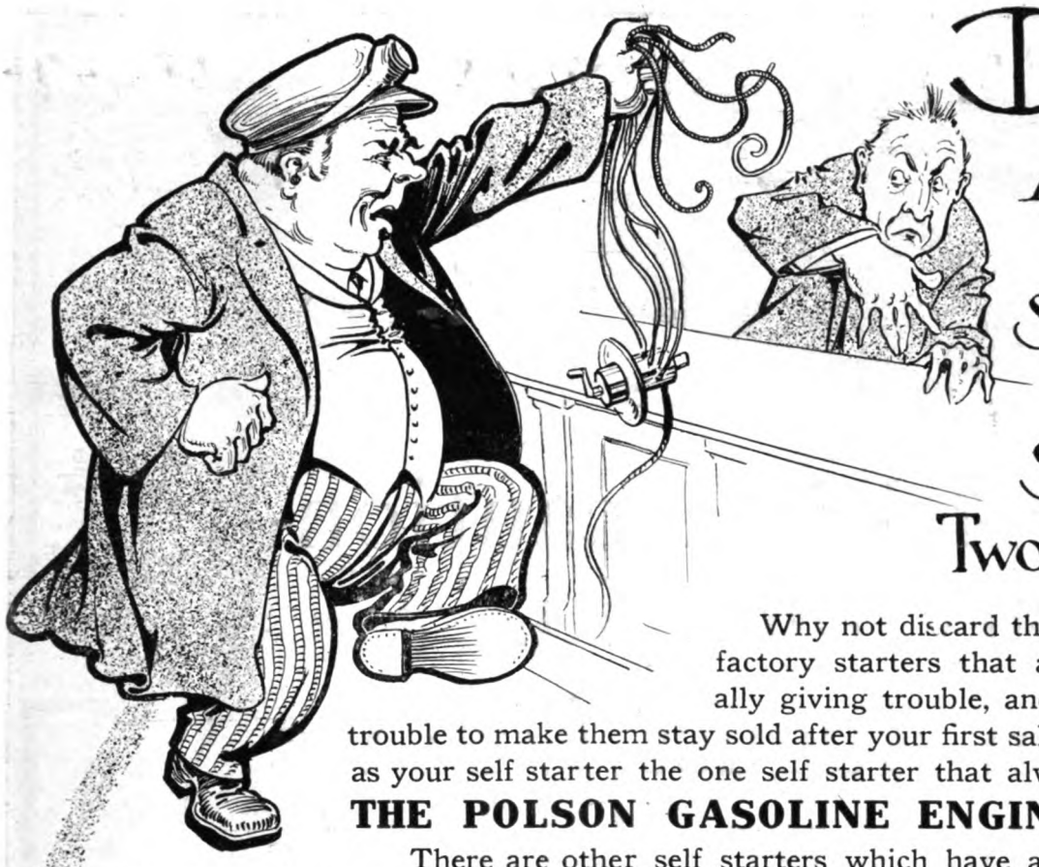
I am thinking of selling cars. [ ]

Mark thus [x]

NYBERG AUTOMOBILE WORKS
ANDERSON, INDIANA

Southern Factory—Chattanooga, Tenn. **Chicago Office—2437-2439 Michigan Avenue**

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Dealers—

Aren't You Tired of Selling the Same Self-Starter Two or Three Times

Why not discard the unsatisfactory starters that are continually giving trouble, and causing you trouble to make them stay sold after your first sale, and substitute as your self starter the one self starter that always stays sold—

THE POLSON GASOLINE ENGINE STARTER.

There are other self starters which have all the merits of the selective cylinder system. There are other self starters which have all the merits of the manifold system, but there is no other self starter which combines all the merits of both systems as does the Polson Gasoline Engine Starter.

The Polson Gasoline Engine Starter by one turn of the dash lever charges not only the cylinders with gas but the manifold as well. It is easy to install—simple—practical—safe, and best of all will make satisfied customers for you instead of dissatisfied customers.

We have a very attractive proposition to make to dealers and representatives in which there is a good margin of profit. Communicate with us at once.

POLSON MANUFACTURING CO.
27 Chenango Street
BUFFALO, N. Y.

POLSON'S Automatic Folding Auxiliary Seats

are made under conditions which insure highest possible quality and extreme durability. We do not aim toward a maximum quantity output but strive earnestly to make our product inimitable in QUALITY and neatness of design.

MANUFACTURERS

POLSON'S Automatic Auxiliary Folding Seats are furnished in the white or all metal parts—enameled and trimmed when so specified. Manufacturers of high class cars who use only the best and strongest of materials should investigate the POLSON SEAT.



We Also Specialize in
Windshields, Bumpers and Wheel Pullers.

GET OUR CIRCULARS.

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THIS is a cautionary bulletin.

¶ On August 17th we make our 1913 announcement.

¶ We firmly believe we will announce the most startling NEWS the trade has ever received. Overlands will break all sales records in the coming season.

¶ We want you in with us. You can be. Just a bit of patience.

The Willys-Overland Company, Toledo, Ohio

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THE MOTOR WORLD

Vol. XXXII New York, U. S. A., Thursday, August 8, 1912 No. 7

SUES TO RELEASE STOCK SECURITY

General Motors Party to Friendly Action to Assist a Reorganizing Company—Echoes of its Own Reorganization.

Echoes of the refinancing of the General Motors Co. in October, 1910, when Wall street interests backed up the reorganization of the big corporation, are awakened by a friendly suit brought in the Supreme Court for New York county by the General Motors Co. against the Central Trust Co. of New York wherein the automobile company seeks an order requiring the trust company to surrender to a reorganization committee of the Heany Co., the Heany Lamp Co. and the Heany Fireproof Wire Co. certain stocks that were pledged by the General Motors as security for its issue of 6 per cent. first lien five-year sinking fund gold notes of date October 1, 1910. Until the suit made the matter public, it was not known that the General Motors' security for its big loan included such stocks.

The Heany Co., the Heany Lamp Co., maker of incandescent lamps, and the Heany Fireproof Wire Co., the first named being a holding company for all of the stock in the other two concerns except that which was pledged, are all closely allied in interests and are to be reorganized and made one corporation. The General Motors Co. is drawn into the case merely as being the owner of Heany stock and the suit is such in form but not in substance. When the Heany reorganization committee was formed, following the admission by the Heany Co. that it required more funds for its current expenses, the stock of the other companies was called in, but when demand was made on the trust company for the pledged Heany stock it refused to give it up without the protection of a court order, and to obtain this the present case was inaugurated. The matter was heard last week by Charles F. Brown as referee, and since he announced before both parties that he would grant the order it is expected within a few days, after which the reorganization will proceed. The pledged stock is valued at $100 per share and is as follows: Heany Co. preferred, 4,883 shares; common, 20,930; Heany Lamp Co., preferred, 2,000, common, 5,950. The authorized and issued stock in the lamp company is 10,000 preferred and 20,000 common, while in the Heany Co. the issue of 6,325 preferred and 27,263 common is close to the authorized limit.

Bulb Horn Sales Company to Dissolve.

The United States Auto Horn Co., of New York, which was formed about two years since to market the bulb horns made by the Nonpareil Horn Co., of New York, and the Automobile Supply & Mfg. Co., of Brooklyn, N. Y., is in process of dissolution, August 26th having been set as the date for a special meeting at which formal action will be taken. Both of the companies that are party to the selling agreement then will go their separate ways. J. J. Cohn, who is president of both the United States Horn Co. and the Nonpareil Horn Co., has acquired entire control of the latter and will proceed to operate accordingly.

Searchlight Again Sued by Prest-O-Lite.

Alleging infringement of its patent, No. 664,585, the Prest-O-Lite Co., of Indianapolis, has brought suit in the Federal Court in that city against the Searchlight Gas Tank Co., of Chicago, which maintains an office in Indianapolis. The infringement charged consists of the refilling of Prest-O-Lite trade-marked tanks, but it is also alleged that the Searchlight people have falsely represented that its goods were those of the Prest-O-Lite Co.

Jeffery Making Quick Trip to London.

Charles T. Jeffery, president of the Thos. B. Jeffery Co., of Kenosha, Wis., sailed yesterday to London on the Lusitania. He will be able to accomplish the business which he has in view so quickly that he will make the return journey on the same steamer.

CHARGES FRAUD IN GRAMM DEAL

Willys Therefore Asks Court to Cancel Contract and to Order His Money Returned—Queer Doings Recited.

If proceedings instituted by John N. Willys, president of the Willys-Overland Co., prove successful, the former owners of the Gramm Motor Truck Co., of Lima, O., will be forced to take back their property, the control of which Willys acquired in April last. He now charges that the condition of the company was misrepresented to him and that fraud was practiced previous to his purchase of the plant, whereby at least a part of the misrepresentation was rendered possible. That Willys made these discoveries or reached these conclusions did not become public property until Thursday last, 1st inst., when he filed suit in the Common Pleas Court in Toledo, asking that the contract be annulled and that notes for $350,000 and $50,000 in cash which he paid for the Gramm property be returned to him.

In his complaint Willys alleges that on April 15th last he entered into a contract with A. L. White, president, and W. T. Agester, treasurer of the Gramm company, on their representation that the company was making money, whereby he agreed to purchase 4,000 shares of stock in the company at par, $50,000 to be paid at the time the contract was signed and the balance to be paid by November 1, 1912. Willys states he gave two notes for $75,000, due August 1 and September 1, and two notes for $100,000, due October 1 and November 1, the notes and stock being deposited in the National Bank of Commerce, which is made defendant with White and Agester.

Willys alleges that at a meeting of the stockholders of the Gramm company, controlled by White and Agester, held September 12, 1911, the company was authorized to pay to the A. C. W. Realty company 1,000 shares of stock, for a fictitious indebtedness, and caused the company to issue a

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delivery certificate, dated August 1, 1911, without receiving any compensation therefor. Ira C. Carns, a stockholder in the Gramm company, is said to control the realty company.

At the same meeting, Willys charges, a dividend of $225,000 was declared, payable in stock, and a division of stock was authorized, when the company had no surplus capital. Shares were distributed as follows, according to the complaint: 750 shares to A. W. C. Realty Co., 221 shares to A. L. White, 150 to W. T. Agester and 196 to I. P. Carns. Total, 1,142 shares.

Willys also alleges that White and Agester voted to themselves respectively 755 and 800 shares of the common stock of the company. All these shares, totaling 3,962, Willys alleges, being sold to him in the 4,000 he contracted to purchase.

Willys now contends, however, that the company had no surplus to divide, but had lost large sums; that it had no legal right to any real estate, but occupied the plant under contract to purchase it, and was indebted in the sum of $135,000, which was not shown in the statement of liabilities presented to him.

After learning of the alleged irregularities Mr. Willys asked the defendants to annul the contract and return his notes and money, and on their refusal filed suit.

Kelly and Field Get Lee Tire Output.

Charles F. U. Kelly, who recently relinquished the presidency of the Kelly-Racine Rubber Co., which he assisted in organizing, and Harry E. Field, at one time vice-president and sales manager of the Hartford Rubber Works Co., and latterly manager of the Rambler branch in New York, have formed the Kelly-Field Co. and will market the entire output of Lee tires and other automobile productions of the Lee Tire & Rubber Co., of Conshohocken, Pa. The Kelly-Field Co., capitalized at $10,000, has been incorporated under the laws of New York and will make its headquarters in New York City. As both men are veterans of the tire industry, and widely known and well liked, it is practically certain that they will cause the Lee productions more than ever to cut a figure in the trade.

Frank Briscoe Leaves U. S. Motor.

Frank Briscoe, one of the several vice-presidents of the United States Motor Co., who had charge of the designing department and who is a brother of President Benjamin Briscoe, has resigned his office, and late in the present month will go to Europe, where he probably will remain a year or more to make a study of European automobile engineering, which indicates that he will not be lost to the automobile industry when he returns. Despite his resignation as a vice-president of the United States company, Briscoe retains the presidency of the Briscoe Mfg. Co., of Detroit, which is a subsidiary of the big corporation and makes radiators and other parts.

THOMAS IS GRANTED AN EXTENSION

Creditors Again Lend Helping Hand When Heavy Obligation Falls Due—Humpage Secures Option on Plant.

The affairs of the E. R. Thomas Motor Car Co., of Buffalo, N. Y., which was reorganized only about a year ago and concerning which conflicting reports have been afloat, again have assumed an interesting stage. Both of the reports appear to have arisen from the fact that $120,000 due on one of the notes for $600,000, which liability was incurred at the time of the reorganization, matured on Thursday last, 1st inst., at which time it was not met. The Thomas creditors, however, once more proved friendly and, acting through W. H. Crosby, of Buffalo, the note has been extended 90 days.

It is generally understood that the control of the Thomas company rests with Eugene Meyer, the New York banker, who assisted the reorganization, who also is heavily interested in the United States Motor Co.; but that a change in the ownership of the Thomas company is not unlikely is indicated by the fact, which he admits, that F. P. Humpage, president of the Thomas company, has obtained an option on the plant, the outcome of which, however, awaits the expiration of the 90-day extension. Humpage states that he can obtain ample capital and is full of confidence that if the option is exercised the company can be put on a paying basis and rendered prosperous.

Creditors Stop Blitzen Engine Starter.

Three creditors, whose claims for money loaned amount to $1,143, on Thursday last, 1st inst., filed a petition in bankruptcy against the Henry Mfg. Co., 141 West 55th street, New York City, which produced the Blitzen engine starter and lighting system. The petitioners allege the company committed an act of bankruptcy in that it permitted the Barney Estates Co. to obtain a judgment for $438, to satisfy which the property was sold by the sheriff for $155 on the 1st inst., on which date, however, Judge Hand, in the United States Circuit Court, signed an order prohibiting interference with the property or assets of the company. Its liabilities exceed $3,000 and its assets are placed at about $1,800. The company was incorporated October 9, 1911, with $100,000 capital stock.

Warren and Pathfinder Join N. A. A. M.

The Warren Motor Car Co., of Detroit, and the Motor Car Mfg. Co., of Indianapolis, have been elected to membership in the National Association of Automobile Manufacturers. The former will be represented by W. C. Teasdale and the latter by Lucius E. Wilson. The representation of three members also has been changed. H. F. Campbell succeeds E. C. Sourbier as representative of the Ideal Motor Car Co., of Indianapolis, Ind.; Gleeson Murphy has succeeded J. F. Corl as the representative of the Rapid Motor Vehicle Co., of Pontiac, Mich., and H. S. Stebbins has succeeded A. M. Bentley as representative of the Reliance Motor Truck Co., of Detroit.

Wishart's Creditors Secure Judgments.

George Wishart, head of the Wishart-Dayton Auto Truck Co. of 501 Fifth avenue, New York city, against which a petition in bankruptcy was filed last week, apparently is destined to hear from whatever creditors he may have, the latest to be heard from being the Farmers' Bank of Canada, of Toronto, which this week filed judgment against him for $56,682.54 in the New York county clerk's office. In the action which led up to the judgment and which was brought in the New York City Court, the bank stated that it secured judgments against Wishart September 29, 1911, in the High Court of Justice for the Province of Ontario, for $53,552.22 and $837.37, which with costs represent the amount named in the judgment; there also was filed against Wishart a judgment for $606.66 by Anna W. H. Nichols, being a claim for rent for the Wishart-Dayton company's service station in West 48th street, New York.

Splitdorf Prepares a Service Station.

The removal of its factory from New York City to Newark, N. J., being well under way, the Splitdorf Electrical Co. has leased the premises 18-20 West 63rd street, New York, which, when equipped, will constitute the Splitdorf branch and service station in the big city. Oscar Rhode, who for several years has managed the Splitdorf branch on Broadway, which will be discontinued, will be in charge of the new place. In addition to Splitdorf magnetos and other ignition specialties, the establishment will carry also the Excelsior carburetters and Eagle windshields manufactured by affiliated companies controlled by John M. Alvord, the new president of the Splitdorf company.

Havers Acquires a Studebaker Plant.

The Havers Motor Car Co., of Port Huron, Mich., has purchased the branch E-M-F plant which the Studebaker Corporation has maintained in that city. It will take possession immediately, and at once proceed to greatly enlarge its output of Havers "six" cars. It is stated that the purchase of the Studebaker plant is but one of several surprising transactions which the Havers company has in store.

Cincinnati Jobbers Dissolve Partnership.

By mutual consent, the partnership existing in Cincinnati, Ohio, between A. C. Davis and Victor Gluckowsky, under the firm style Coughlin & Davis, has been dissolved, Gluckowsky retiring. The jobbing business will be continued by Davis in his own name.

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FISCAL YEAR ESTABLISHES RECORD

Cars and Parts Exported from United States Total Over $25,000,000—Gain of 65 per cent. Over Preceding Year.

Like the calendar year itself and bettering by 65 per cent. the figures for the corresponding twelve months of the previous year, the Federal fiscal or statistical year, which ended with June, 1912, established a record mark in valuation of automobiles and parts exported from the United States, total being $25,657,294. The valuation for the year ending with the preceding June was $15,509,229, and the gain in dollars was $10,148,065. Of this total for the past year nearly one-fifth, or $4,107,155, represents parts of cars, and this is three-fifths greater than the value of the parts exported for the year ending with June, 1911. Canada took the largest valuation and the greatest number of cars, with the United Kingdom second, while but four of the twelve geographical divisions failed to record a gain over the preceding year. The average value of the 21,757 cars exported in the year just ended was $990, which is about 10 per cent. less than the average valuation of $1,098 for the preceding twelve months.

June, 1912, also showed a gain of 22 per cent. in valuation of cars and parts over June, 1911, the total being $2,478,009 and the gain $450,251. Of the twelve geographical divisions Canada held its own with the largest number of cars and also recorded the greatest gain, its receipts totaling $1,026,567 and its gain being $164,532 over June of 1911. The increases ranged downward from this figure to $4,098 recorded for the West Indies and Bermuda, and the smallest shipment was to Mexico, whither cars valued at $8,470 were sent. The only divisions to show a loss were the United Kingdom, British Oceania and Mexico, the loss in the former, $306,421, being of such size as to be noticeable.

The comparative average values of cars for the Junes of 1912 and 1911 were respectively $1,090 and $1,095, a decrease of $5. The record in detail is as follows:

Trustees Removed; Receiver Appointed.

In response to the plea of several local creditors, the Federal court last week removed the trustees for the Auto Specialty Co., 1506 Grand avenue, Kansas City, who were appointed July 10th, when an involuntary petition in bankruptcy was filed against the company. After the removal of the trustees, Albert J. Martin, a United States marshal, was appointed receiver. The creditors at whose instance the trustees were removed intended no reflection on the latter, but they do charge irregularities in the conduct of the Auto Specialty Co., of which H. D. Todd is president.

Tire Exports Show Substantial Gain.

The valuation of tires exported from the United States during June, 1912, shows a gain of 30 per cent. as compared with the value of the tires exported in the same month of the previous year—$321,889 as against $246,625, an increase of $75,264. Supplementing this favorable comparison are the comparative figures for the twelve-month periods ending with the Junes of 1911 and 1912. For the former term the valuation of the exports was $2,085,107 and for the latter $2,657,809, an increase of $572,702, or 27 per cent.

Weed Brings Another Infringement Suit.

The Weed Chain Tire Grip Co. this week filed a suit in the United States District Court for the Southern District of New York against Joseph A. Del Solar of 80 Warren street, New York City, an accessory dealer, alleging infringement of the Parsons patent, No. 723,299. Del Solar is charged with handling the Perry grip, made by the Perry Tire Chain Co. of Lansing, Mich.

McCutchan Links Fortunes with Fulton.

J. J. McCutchan, for five years the Splitdorf representative in Chicago, has acquired an interest in the Fulton-Grubb Co. of that city, the title of which has been changed to Fulton-McCutchan Co., which will continue as jobbers and manufacturers' agents. John Fulton remains president, McCutchan becoming vice-preisdent and general manager and J. F. Keegan secretary.

ARISTOS IS ATTACHED BY DISCO

Manufacturers of Engine Starters and Their New York Representative Fall Apart—Irregularities Are Alleged.

That the Aristos Co., which has offices at 250 West 54th street, New York City, and which is sales agent for the Ignition Starter Co., of Detroit, Mich., in the Northeastern United States and a considerable portion of other sections is not on the best of terms with the manufacturer of Disco engine starters is indicated by a lawsuit in the Supreme Court for New York county which this week resulted in the issuance of an attachment against the Aristos concern; the attachment, however, was vacated when the defendant provided a bond as security. The amount of the attachment was $12,785.83 and approximates the value of starters which are alleged to be unpaid for by the New York company.

Just what precipitated the litigation is not made clear, but the Ignition company in two separate causes of action sets up claims for $21,000 and $22,000. In support of them William E. Raiguel, the Ignition company's sales manager, makes oath that the selling contract was executed February 27, 1912, and that between that time and May 1 the Aristos Co. received starters to the value of $26,019.21. May 1 the contract was altered, and subsequent to the alteration, it is claimed the Aristos concern was the consignee of starters to the value of $709.57, making a total of $26,728.78, of which there remains an unpaid balance of $8,154.53.

The change in the contract May 1 related to a reduction of about 40 per cent., more or less, in the price of Disco starters, and to reimburse dealers for loss they would sustain in stock on hand through the cut the Ignition company claims it sent the Aristos Co. 366 starters, valued at $4.538, which were intended, according to the complaint, for distribution among the dealers affected. This part of the arrangement the starter company alleges the New York concern failed to carry out, distributing

	June				Twelve Months Ending June					
	1911		1912		1910		1911		1912	
	Quantities.	Values.	Quantities.	Values.	Quantities.	Values.	Quantities.	Values.	Quantities.	Values.
Automobiles	1,554	$1,702,872	1,941	$2,116,174	6,926	$9,548,700	11,803	$12,965,049	21,757	$21,550,139
Exported to—										
United Kingdom		529,382	327	222,961		2,656,214		2,595,679	5,716	4,454,448
France		37,948	67	49,905		825,904		532,121	574	469,721
Germany		19,886	27	35,787		275,241		251,629	288	226,227
Italy		18,517	42	35,185		337,614		215,041	211	193,037
Other Europe		117,555	161	161,123		550,414		764,287	1,223	1,031,434
Canada		861,975	755	1,026,567		4,383,487		6,774,769	6,288	7,560,655
Mexico		40,861	7	8,470		540,325		649,666	273	418,599
West Indies and Bermuda		27,724	30	31,822		413,888		398,593	329	350,440
South America		99,040	167	174,145		342,767		891,133	1,611	1,911,066
British Oceania		206,130	146	143,376		350,193		1,352,532	3,625	3,280,988
Asia and other Oceania		52,801	136	158,478		348,523		786,570	1,137	1,197,155
Other countries		15,939	76	68,355		165,650		297,209	482	456,369
Parts of (except tires)		324,886		361,835		1,641,520		2,544,180		4,107,155
Total		$2,027,758		$2,478,009		$11,190,220		$15,509,229		$25,657,294

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only about 50 starters. Another allegation is that the Aristos Co. failed properly to push things in its territory and to give service demonstrations, and that the Ignition company was compelled to go into the field itself and will be compelled to do so, all of which, the account and all, is estimated as damaging to the extent of $21,000.

In the second cause for action these allegations are repeated, and there is added a claim for $1,000 which the Ignition company claims the Aristos Co. promised to pay to assist in defraying the expenses of the Disco advertising. Besides the New York office, the contract provided that offices be maintained in Boston, Philadelphia, Pittsburgh and in Baltimore or Washington, D. C. Several minor violations of contract alleged are a failure to supply the Ignition company with a list of the Aristos dealers and failure to report monthly.

Valentine Takes on the Poss Trucks.

J. H. Valentine, who recently disposed of his interests in the J. H. Valentine Co., of Syracuse, N. Y., which handles the Chalmers car in addition to manufacturing the Hanna engine starter, has taken the Eastern sales management for the Poss Motor Co., of Detroit, Mich., and will market the Poss truck in this part of the country. Reports that Valentine had removed to Rochester, N. Y., to engage in the manufacturing business there are incorrect. He will continue to make Syracuse his business headquarters. Charles G. Hanna, who is in charge of the J. H. Valentine Co., is reorganizing its affairs and the business shortly will be taken over by a new corporation.

Columbus Parts Company Now Certain.

Forty-five thousand dollars having been raised by the sale of 150 building lots in Columbus, Ind., the organization of the proposed Columbus Auto Parts Co. is assured. It is to be incorporated with $250,000 capital stock and will acquire the plant of the defunct Janney Mfg. Co., which will be utilized chiefly for the manufacture of cylinder castings. Among those who are identified with the project are J. I. Handley, of Indianapolis, president of the American and Marion Motor Car companies; S. H. Penfield and Benjamin S. Dean, of the Salisbury Wheel & Mfg. Co., Jamestown, N. Y., and Fletcher Goodwill of Detroit.

Jeffery Makes Large Real Estate Purchase.

Thomas B. Jeffery Co. last week consummated the purchase of nine acres of land adjoining its present plant in Kenosha, Wis. It is understood that the site will be used for the erection of an addition to the Rambler plant, which will be devoted chiefly to the manufacture of trucks.

Emery Oils to Flow in New York City.

The Emery Mfg. Co., of Bradford, Pa., producers of Emco oils and greases, has established a branch in New York City. It is located in the United States Rubber building at 58th street and Broadway.

McCOYS TO MAKE CARBURETTERS

Big Manufacturers of Lighting Fixtures Form $200,000 Company for the Purpose—Carburetter Has 14 Jets.

Edward A. McCoy, who is intimately connected with the affairs of J. B. McCoy & Son, of New York City, which company has an established reputation as a manufacturer and importer of electric and gas lighting fixtures and bronze work and maintains a five-story factory at 114-120 West 30th street, is the prime mover in the Maxi Co., which was incorporated this week under New York laws with $200,000 capital stock to manufacture and deal in a new type of carburetter, of which McCoy is the inventor. Also, McCoy is president and treasurer of the new company, and though most of the others who are associated with him are practically unknown to the automobile industry, at least one of the names that is linked with his is not wholly new to the trade. Ernest Hopkinson, whose connection as general counsel for the Rubber Goods Mfg. Co. has served to make him known to the automobile trade, is vice-president, and in addition he will look after the patent interests of the company. Of the other incorporators, Dr. John C. McCoy, who is a Paterson (N. J.) physician, is secretary, and Frederick Richardson, who is connected with J. B. McCoy & Son, is assistant secretary-treasurer.

In choosing the distinctive title "Maxi" for the company, it has been intended to convey that the carburetter, which bears the same name, has been designed to realize maximum carburetter efficiency, and the manner in which the problem has been attacked is unusual. The device lacks the usual spring controlled auxiliary air valve and is further distinguished by reason of the fact that it employs no less than 14 fuel outlet passages. Despite this apparent complication, however, the device is absolutely adjustmentless.

For the present, only a limited number of carburetters are being manufactured in the McCoy factory on West 30th street, a whole floor having been set aside for the purpose, though no attempt is being made as yet to supply the demand which already has been created.

Long Disputed Note Finally is Paid.

After having been the cause of a lawsuit in the New York City Court a note for $400, given April 25, 1912, by the Motor Car Exchange of 250 West 54th street to E. J. Willis, of the E. J. Willis Co. of 85 Chambers street, automobile supply dealers, finally has been paid, according to notice of a satisfied judgment filed this week in the New York county clerk's office. But instead of Willis being the complainant in the action, it was Joseph Harris who sought satisfaction. The note was given by the Motor Car Exchange and, before maturity, was indorsed by Frederick F. Goodman and Frank D. Homan of the Exchange and by Willis and the Willis company, after which it passed into the hands of Harris. When the note was protested Harris sued all four endorsers and the maker of the note, but in the consummation of his action only Homan, Goodman and the Exchange appeared. The costs brought the amount of the judgment to $428.43.

Sues to Recover Value of Demonstrater.

How much title an automobile dealer has to a demonstrating car for which he has not paid the manufacturer is not generally a matter of dispute in the automobile trade, but it seems that the question will have to be adjudicated in the case of William M. Redfield and Maurice Levi, who at one time traded in New York City as Imperial dealers under the style Redfield & Levi. The Imperial Automobile Co. of Port Huron, Mich., has instituted an action against them in the Supreme Court for New York county for $1,800, which is claimed as the price of the car in question. The Imperial company claims it consigned the car to the men in October, 1911, that it was not paid for, and that when its return was demanded the car was not forthcoming, having been disposed of to others.

Republic Increases Capital; Cuts Melon.

At a special meeting of the stockholders of the Republic Rubber Co., in Youngstown, O., on Saturday last, 3rd inst., the recommendation of the directors that the capital stock be increased from $4,000,000 to $10,000,000 was ratified. At a subsequent meeting of the directors a special dividend of 35 per cent., payable in common stock, was declared, as was the usual quarterly dividend of 2¼ per cent. The new capitalization will be $6,000,000 common and $4,000,000 preferred, as against $2,000.000 each, common and preferred, under the previous order of things. To permit of projected improvement, it is understood that a block of the new preferred stock shortly will be offered at par to the public.

Overland Men in a New Enterprise.

Isaac Kinsey, Walter Stewart and James E. Kepperley, all of whom are closely identified with the Willys-Overland Co., are among the incorporators of the Mechanical Process Mfg. Co., of Toledo, O., which has been organized under the laws of that state with $10,000 capital. They have in view the manufacture of patented articles, the nature of which is something of a secret and concerning which they will say nothing until experimentation proves their success.

Connecticut Opens Branch in Chicago.

The Connecticut Telephone & Electric Co., of Meriden, Conn., manufacturers of Connecticut ignition specialties and shock absorbers, have opened a branch in Chicago at 1463 Michigan avenue. It is in charge of W. J. Johnston.

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Philadelphia, Pa.—Peerless Rubber Co., under Pennsylvania laws, with $20,000 capital; to deal in motor cars.

Flint, Mich.—Auto Sales and Supply Co., under Michigan laws, with $25,000 capital; to deal in motor car supplies.

Detroit, Mich.—Hercules Motor Truck Selling Co., under Michigan laws, with $50,000 capital; to deal in motor vehicles.

Indianapolis, Ind.—Fisk Rubber Co., a New York corporation with $100,000 capital; certified to do business in Indiana with $5,000 capital.

Racine, Wis.—Faultless Starter Co., under Wisconsin laws; to manufacture engine starters. Corporators—C. I. Schoop, J. L. Barker, M. E. Walker.

Tacoma. Wash.—Union Motor Car Co., under Washington laws; to deal in motor cars. Corporators—R. A. McCormack, George A. Stewart and others.

Chicago, Ill.—Oakwood Electric Garage, under Illinois laws, with $2,500 capital; to operate a garage. Corporators—Milan E. Coin, Robert H. Zoller and others.

Cambridge, Mass.—Blake Automobile Co., under Massachusetts laws, with $100,000 capital; to deal in motor cars. Corporators—E. C. Blake and others.

Jersey City, N. J.—Thomas Wolverton Co., under New Jersey laws, with $10,000 capital; to deal in motor cars. Corporators—C. A. Cole, H. T. Letts and others.

Fargo, Ill.—Fargo Motor Car Co., under Illinois laws, with $50,000 capital; to deal in motor cars. Corporators—Joseph Kral, B. F. Kral, A. A. Vesley, E. G. Kral.

Portland, Me.—Anti-Friction Bearing Co., under Maine laws, with $500,000 capital; to manufacture bearings. Corporators—C. H. Chapman, E. Perry and others.

Newark, N. J.—Sullivan Automobile Co., under New Jersey laws, with $25,000 capital; to deal in motor cars. Corporators—J. Sullivan, C. Bagnole, W. N. Frankel.

Cleveland, Ohio—Arter Auto Carriage Co., under Ohio laws, with $20,000 capital; to manufacture motor cars. Corporators—John G. Arter, B. Hexter, James B. Ruhl.

Seattle, Wash.—Modern Tread Co., under Washington laws, with $20,000 capital; to manufacture motor car tires. Corporators—L. V. Fox, A. H. Shoemaker and others.

Cleveland, O.—Davies-Bach Mfg. Co., under Ohio laws, with $300,000 capital; to manufacture motor car accessories. Corporators—George R. Nash, C. H. Davies, O. Nelson, O. Lampus, P. D. Metger.

Des Moines, Ia.—Iowa State Mutual Automobile Insurance Association, under under Iowa laws; to conduct an automobile insurance business. Corporators—R. M. Finlayson, M. H. Thielen, H. C. Kelley and others.

Wilmington, Del.—Wallace Automobile Co., under Delaware laws, with $300,000 capital; to deal in motor cars. Corporators—C. J. Jacobs, S. E. Roberson, H. W. Davis.

Newport, Ky.—Central Automobile Co., under Kentucky laws, with $15,000 capital; to deal in motor cars. Corporators—Walter P. Dickerson, Gus Koehler, Clyde Emerick.

St. Louis, Mo.—Pugh Auto Chain Co., under Missouri laws, with $5,000 capital; to manufacture non-skid chains. Corporators—John Schulz, Webster Groves, A. A. Van Cleve.

Fresno, Cal.—Essenkay Sales Co. of Fresno, under California laws, with $5,000 capital; to deal in tire fillers. Corporators—H. M. Wachaffer, P. W. Cypher and others.

Jamesburg, N. J.—Ex-Cel Motor Truck Co., under New Jersey laws, with $250,000 capital; to deal in motor vehicles. Corporators—T. C. Corwin, A. Englehardt, A. A. Kelley.

Akron, O.—Majestic Rubber Co., under Ohio laws, with $3,000 capital; to manufacture motor car tires. Corporators—E. Christman, A. L. Neiswanger, C. W. Baum, J. H. Ault.

Canton, Ohio—Central Motor Car Co., under Ohio laws, with $25,000 capital; to deal in motor cars. Corporators—R. F. Wilson, D. L. Tachants, D. B. Wilson, Anna Herr.

Spokane, Wash.—Fox Spring Tire Co., under Washington laws, with $1,000,000 capital; to manufacture motor car tires. Corporators—Porter C. Fox, D. D. Woolsley, W. E. Allen.

Wilmington, Del.—Fletcherite Metal Co., under Delaware laws, with $150,000 capital; to manufacture bearing metals. Corporators—E. E. McWhiney, W. J. Maloney, N. P. Coffin.

Pittsburgh, Pa.—Pittsburgh Motor Service Corporation, under Pennsylvania laws, with $60,000 capital; to deal in motor cars. Corporators—A. X. Phelan, Paul Azolill, C. T. Williams.

Hartford, Conn.—Capitol City Garage Co., under Connecticut laws, with $50,000 capital; to operate a garage. Corporators—Conrad Hale Brooks, James Leslie Burton and others.

Akron, Ohio—Akron Airless Tire Co., under Ohio laws, with $50,000 capital; to manufacture motor car tires. Corporators—William S. Brookes, Joseph J. Surbey, Ira N. Thompson, Frank H. Betes, H. Lane Cole.

Kansas City, Mo.—Hudson-Latham Motor Co., under Missouri laws, with $10,000 capital; to deal in motor cars. Corporators—W. Latham, C. B. Boyd, William M. Boyd and others.

Winchester, Conn.—Brown Machine Co., under Connecticut laws, with $5,000 capital; to deal in and repair motor vehicles. Corporators—Edward E. Brown, William A. Brown and others.

New Haven, Conn.—R. L. Bishop Motors Co., under Connecticut laws, with $25,000 capital; to deal in motor cars. Corporators—Raymond L. Bishop, William F. Sargent and others.

Wilmington, Del.—Protective Auto League, Inc., under Delaware laws, with $1,000,000 capital; to deal in motor car supplies. Corporators—I. Fogg, G. D. Hopkins, G. W. Dillman.

Cincinnati, O.—Victor Auto Parts Co., under Ohio laws, with $20,000 capital; to manufacture motor parts. Corporators—William J. Corcoran, Harvey B. Corcoran, Edward S. Corcoran.

Sheboygan, Wis.—Sheboygan Auto and Supply Co., under Wisconsin laws, with $15,000 capital; to deal in motor cars and supplies. Corporators—Charles F. Kade, C. F. Thieman, Felix Beney.

Indianapolis, Ind.—Indianapolis Tire Co., under Indiana laws, with $300,000 capital; to manufacture motor car tires. Corporators—A. A. McKain, E. J. Holliday, D. M. Parry, H. G. Wright, A. C. Ayres.

Dayton, Ohio—Stocker Rubber Co., under Ohio laws, with $10,000 capital; to deal in motor car tires. Corporators—A. D. Stocker, Ira J. Cooper, H. H. Brenner, F. W. Johnston, J. W. Brumbaugh.

Cincinnati, Ohio—Welbon Motor Car Co., under Ohio laws, with $25,000 capital; to manufacture motor cars. Corporators—W. E. Welbon, H. S. Leyman, C. D. Wilson, C. W. Shepler, H. A. Welbon.

Cincinnati, Ohio—Cincinnati Motor Car Co., under Ohio laws, with $10,000 capital; to manufacture motor cars. Corporators—C. D. Wilson, H. C. Heisey, N. C. W. Shopler, J. O. Miller, R. M. Connor.

East Palestine, Ohio—East Palestine Rubber Co., under Ohio laws, with $50,000 capital; to deal in motor car tires. Corporators—E. E. Jones, Ulrich Winter, G. A. Oatsdean, Joe Hick, C. L. Shumate.

New York, N. Y.—Wadsworth Garage, Inc., under New York laws, with $9,000 capital; to deal in motor cars and operate a garage. Corporators—William Daly, 1254

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Shakespeare avenue; Albert C. Christian, 1256 Shakespeare avenue; George A. Boyd, 177 Bowne avenue, Flushing.

St. Louis, Mo.—Cabanne Automobile Club Co., under Missouri laws, with $50,000 capital; to deal in motor cars and supplies. Corporators—Charles F. Haanel, Henry L. Hargermann, William A. Nicholson, Jr.

Wilmington, Del.—International Automobile League Tire and Rubber Co., under Delaware laws, with $1,000,000 capital; to deal in motor cars and supplies. Corporators—C. J. Jacobs, R. B. Cooling, H. W. Davis.

Boston, Mass.—Elliott Motor Engine Co., under Massachusetts laws, with $300,000 capital; to manufacture internal combustion motors. Corporators—Gilbert R. Elliott, Frank P. Harris, Henry N. Schwartz.

Charleston, W. Va.—Automobile Engineering College, under West Virginia laws, with $5,000 capital; to conduct an automobile school. Corporators—Frank N. Justice, Edgar L. Turner, Thomas W. Smithfield.

Toledo, Ohio.—Mechanical Process Mfg. Co., under Ohio laws, with $10,000 capital; to manufacture machinery, tools, etc. Corporators—Walter Stewart, Isaac Kinsey, Albert H. Smith. Royal R. Scott, James E. Kepperley.

New York, N. Y.—Kelly-Field Co., under New York laws, with $10,000 capital; to manufacture and deal in cars, tires, etc. Corporators—Charles F. U. Kelly, Racine, Wis.; Harry E. Field and Jacques L. Boisse, both of 2 Rector street.

Brooklyn, N. Y.—Penn Auto Co., under New York laws, with $5,000 capital; to deal in motor cars. Corporators—Louis L. Wendell, 262 Rochester avenue; Harry C. Partridge, 248 Rochester avenue; Morris Wolf, 302 Broadway, New York City.

New York, N. Y.—Maxi Co., under New York laws, with $200,000 capital; to manufacture carburetters. Corporators—Edward A. McCoy, 112 Washington street, East Orange, N. J.; Ernest Hopkinson, 110 Washington street, East Orange; F. V. W. Richardson, 251 West 123d street; John C. McCoy, 158 Broadway, Paterson, N. J.

Recent Losses by Fire.

Beverley, Mass.—Sullivan Garage, Railroad avenue, damaged. Loss, $1,200.

Cleveland, O.—H. & H. Garage, 118 High avenue, S. E., damaged. Loss, $6,000.

Winona Lake, Ind.—Winona Garage and four cars destroyed. Loss not stated.

Vancouver, B. C.—A. B. C. Motor Co., 50 cars, property of private owners, and warehouses destroyed. Loss $225,000.

Amarillo, Tex.—Panhandle Cadillac Motor Co., offices, garage, machine shop and several cars destroyed. Loss, $40,000.

Chicago, Ill.—Haynes Automobile Co., 1702 South Michigan avenue, six cars destroyed, garage damaged. Loss, $15,000.

MEN WHO HAVE SHIFTED POSITIONS

Resignations and Promotions That Served to Place Many Workers in New Places —Few Leave the Trade.

A. E. Williams has been appointed advertising manager for the Swinehart Tire & Rubber Co., of Akron, Ohio. Previously he was a member of the Firestone advertising department.

A. L. Lathrop, superintendent and designing engineer of the W. A. Paterson Co., of Flint, Mich., maker of the Paterson car, has resigned those positions. His future plans have not been made known.

F. Walter Guibert has been appointed Western sales manager for the Frontier Iron Works, of Buffalo, N. Y., which manufactures cylinder castings. He will make his headquarters in the Ford building in Detroit.

W. H. Bell, who has had charge of the pneumatic tires sales department of the Firestone Tire & Rubber Co., in Akron, O., has been promoted to the management of the Firestone branch in San Francisco. He already has assumed his new office.

Harry Fosdick, who recently resigned the sales management of the Stevens-Duryea Co., of Chicopee Falls, Mass., and removed to Detroit, has become a member of the staff of the Hupp Motor Car Corporation. He will serve as assistant sales manager.

J. W. Shelor has been promoted to the management of the United Motor Dallas Co. to fill the vacancy caused by the resignation of M. A. Sackstader. Shelor has been identified with the Texas interests of the United States Motor Co. for some two years.

J. H. Hansen, who has had the R-C-H agency in South Bend, Ind., has been appointed district sales manager for the R-C-H Corporation with the states of Iowa, Kansas and Nebraska as his territory. He will establish headquarters in Omaha.

W. B. Payne, who has acted as special representative for the Studebaker Corporation on Long Island, has engaged with the Tanner Motor Car Co., of Brooklyn, N. Y. He will handle the Everitt and Oldsmobile cars in that territory and also will have charge of the Tanner wholesale sales department.

Having resigned as one of the division advertising managers of the United States Motor Co., W. McKay White has been appointed advertising manager for the Marion Sales Co., of Indianapolis. As previous to his connection with the United States company he was advertising manager for the Premier Motor Car Co., White is not strange to Indianapolis.

T. S. Johnston, manager of the Washington (D. C.) branch of the Buick Motor Co., has resigned that position to join the sales staff of the Republic Motor Co., W. C. Durant's most recent enterprise. Johnston will make his headquarters in Philadelphia, and will direct the marketing of the Chevrolet and Little cars in that territory which is south and southwest of New York.

Automobile Imports Decrease in June.

Uncle Sam's records covering the import of automobiles into the United States show a heavy falling off in volume for June, 1912, as compared with June, 1911, the percentage of decrease being slightly in excess of 60 per cent. During last June but 42 cars, valued at $100,927, were brought into the country, as against 117 cars, valued at $256,514, during the corresponding month of 1911.

	June, 1911. No.	Value.	June, 1912. No.	Value.
Imported from—				
United Kingdom	12	$31,820	7	$17,105
France	29	69,424	21	50,106
Germany	41	81,513	3	8,806
Italy	14	21,385	5	10,425
Other countries	21	52,372	6	14,485
Total cars	117	$256,514	42	$100,927
Parts of		15,748		20,408
Total cars and parts		$272,262		$121,335

The import of parts, however, showed a considerable gain, the figure for June, 1911, which was $15,748, rising to $20,408 by June, 1912, a gain of nearly 30 per cent.

Statistics for the twelve months ending with June, which constitute the governmental year, show that 963 cars, valued at $2,134,181, were imported, as compared with 888 cars, valued at $1,898,843 for the twelve months expiring with June, 1911, a gain of a little more than 7 per cent. in number and slightly more than 13 per cent. in valuation. The parts imported during the twelve months ending with June, 1912, were valued at $304,144, and at $351,916 for the preceding twelve-month period, a loss of 14 per cent.

Slowing up of Engine Exports in June.

The exportation of automobile engines from the United States for the month of June, while an absence of earlier records makes impossible a comparison with preceding Junes, shows a decrease as compared with the exports for the month of May, 1912; the June exports numbered 547 engines and were valued at $51,818, an average of $95 per motor, while the May exports were 571 in number, with a valuation of $67,627, an average value of $118. During the twelve months ending with June, 1912, there were shipped from the United States 6,891 engines, valued at $778,098, but as the government did not then keep the record separately, no comparison with the corresponding period of the previous year is possible.

Chapin Sails for Visit to Europe.

H. W. Chapin, treasurer and manager of the Brown-Lipe Gear Co., of Syracuse, N. Y., sailed last week to Europe. He will be absent for several weeks.

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John Fender has opened a garage in Tingley, Ia.

Ernest Lawson is about to open a garage in Anna, Ill.

J. M. Ingraham has opened a garage in Sandstone, Minn.

Brewer Bros. are about to erect a garage in Canaan, Conn.

R. W. Grant is about to open a garage in Ladysmith, Wis.

The Traverse (Mich.) City Iron Works is about to build a garage.

James Moore of La Grange, Ga., has sold his garage to W. P. Burks.

William J. Montgomery of Germantown, Pa., plans to erect a garage.

Jensen Bros. have opened a garage on Front street, Santa Cruz, Cal.

E. H. Mahoney is about to build a garage, 40 x 50 feet, in La Porte, Ia.

A two-story brick garage is being erected in Deadwood, S. D., for R. H. McComb.

J. A. Tyler is about to enter the garage and automobile livery field in Malvern, Ia.

M. G. Van Nice of Russell, Ia., has established a garage in Murray, in the same state.

George Schneider of Middletown, N. J., plans to operate a garage on Monmouth avenue.

D. J. Kerrigan and Richard Dickman are about to build a garage, 40 x 150 feet, in Minonk, Ill.

The Maurer Garage in Sheboygan, Wis., has been taken over by the Sheboygan Auto & Supply Co.

John Anderson of Aberdeen, S. D., has purchased the George Sommers Garage on Fourth avenue, West.

A. J. Oaks, C. D. Gramlin and R. L. Miller of South Fork, Pa., are erecting a garage on Lake street.

J. R. Barrett and William Reinking of Holstein, Ia., have formed a co-partnership to handle the Cadillac.

Dr. J. N. Cozzene of Nevada, Ia., has taken the Ford agency for the township of New Albany, in that state.

Under the style Mission Garage, Thomas Leedom is about to open up in Long Beach, Cal., at 245 East 4th street.

Ray Balrige is building a garage on Braddock avenue, Braddock, Pa. It will have accommodations for 75 cars.

Cary Bros. are building a garage on East Elm street, Lodi, Cal. They will operate under the style Sierra Garage.

H. G. Razall of Milwaukee, Wis., is about to build a garage at Hackett avenue and Park place; it will cost $6,000.

William Mahan has opened a supply store at 221 Delaware avenue, Wilmington, Del. He has the agency for Lee tires.

An electric garage is being built in Long Beach, Cal., for Alan C. Walker; it will represent an expenditure of $10,000.

Henry Quinsel, a garage operator in Towanda, Ill., has entered the selling field; he has the Marion and Stutz lines.

George P. Dier of Bozeman, Mont., is about to build a garage at West Mendenhall street and North Central avenue.

J. E. DeMont of San Leandro, Cal., has applied for permission to build a garage at San Leandro avenue and Ward street.

David Bernstein of Evansville, Ind., has let the contract for a brick garage; it will be erected at 102-6 Upper Third street.

J. T. Sonnichsen of Ewing, Neb., is making ready to build a garage 50 x 120 feet, on Main street; he will lease the structure.

W. P. Ladwig, of Milwaukee, Wis., is to build a garage at 1459 Green Bay avenue; it will represent an expenditure of $6,000.

C. S. Miller of Woodstock, Minn., is excavating for a garage, 24 x 50 feet; his equipment will include an air compressor.

F. W. Ayres is about to erect a garage at 11th and West streets, Wilmington, Del. He has taken the Stoddard-Dayton agency.

Bleeker Bros. have purchased the business of the Wilmington (N. C.) Auto Repair Co. The garage is on North Third street.

H. B. Cushman and E. C. Bemis, of Adair, Ia., have purchased the Lalley Garage; they will operate it under the style Adair Auto Co.

Gunder Osjord of Granville, N. D., has sold his garage to Edward Pruitt and Boaz Jorgenson; possession will be given September 1.

William McConnell and Arthur Johnson have formed an automobile repair firm in Sioux City, Ia. They will open up at 317 Fifth street.

Hathorn Garage is the style of a business to be launched on East 5th street, Mason City, Ia.; the contract calls for a building 52 x 122 feet.

The Burt (Ia.) Auto Co. has dissolved; M. Mann, a member of the concern, will continue the business, which includes the Ford agency.

C. B. Sage has purchased of R. A. Parker the Standard Automobile Garage at 233-37 Ontario street, Toledo, O. Sage hails from Bradford, Pa.

J. S. Waterland of Chico, Cal., has applied for permission to erect a corrugated iron garage in the center of the city, covering half a block; it will represent an expenditure of $10,000.

William Bonner of Wappinger Falls, N. Y., is about to build a garage; he will utilize the site of the Dusenbury Garage, which is being razed.

Shallberg Bros. of Moline, Ill., have disposed of the Olson Garage to Thompson Bros. of Grand Forks, N. D. The deal involved $52,000.

Edward Spongly of Chicago has secured permission to erect a one-story brick garage at 649 Diversey boulevard; its cost will be $23,000.

M. L. Gothoasis, of Washington, D. C., has had plans prepared for a brick garage to be erected at 712 7th street, North East; it will cost $3,000.

The Hutchnison (Kan.) Garage has been closed by Carl Richardson, as receiver in bankruptcy; an adjudication is being made in the Federal court.

Roy Moorman & Co. of El Centro, Cal., are about to open an automobile supply store; they assert it will be the largest in Southeastern California.

G. Bulthuis of Parkersburg, Ia., has bought the stock of Palmer & Gilley, supply dealers, and will combine their business with his garage trade.

The Gila Valley Auto Transfer Co. has been organized in Globe, Ariz., by R. Dale Thomas; the business will include the sale of Pierce-Arrow and Packard cars.

The Malden (Mass.) Electric Co. has been granted authority to erect a garage on Middlesex street; the application names $15,000 as the cost of the structure.

The Autocar Co., of Ardmore, Pa., has leased a four-story garage at 418 Washington street, Newark, N. J., for a period of ten years. The rental aggregates $70,000.

C. B. Futch and W. B. Towles have entered the trade in Savannah, Ga., under the style Motor Car Repair and Supply Co. They are located at 222 East Broughton street.

George M. Rosemeier, an operator of taxicabs at 202 Amsterdam avenue, New York City, filed a petition in bankruptcy last week; his liabilities are $1,840, with nominal assets.

Luther B. Scherer of Los Angeles, Cal., has placed contracts for the construction of a garage, 50 x 150 feet, at Echo Park avenue and Sunset boulevard; the estimated cost is $10,000.

The Essex Dahl Tire Filler Co. has been organized in Newark, N. J., by Harry W. Smith and A. M. Linnett, Jr., for the

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purpose of handling the Dahl tire filler in Essex county. The new firm is located at 293 Halsey street.

The Universal Motor Truck Co. has taken possession of the service station erected for its occupancy at 146-150 West 63rd street, New York. The structure is of three stories. 35 x 100 feet.

Having been organized for that purpose, a new firm comprising Frank Roberts and Edward R. Sherburne has taken the American agency in Boston, with temporary quarters at 121 Massachusetts avenue; later, offices and salesrooms will be located on Boylston street, with a service station on Bickerstaff avenue. Roberts is a custom house broker, while Sherburne is connected with the sugar trade.

The United States Motor Co.'s business in Toledo, O., which has been handled for several years under the style United Motor Toledo Co., with W. H. McIntyre as manager, has been taken over by the W. H. McIntyre Co., which was formed for the purpose. The incorporators are McIntyre, William Vollmayer, Edward Laskey and Frank Kelly, and the capitalization is $10,000. The old place of business at Madison avenue and Tenth street is retained.

Upon the petition of Ike W. Clinkofstine, president of the Seeley Motor Car Co., an agency in Saginaw, Mich., the Federal court last week appointed Thomas Hayes receiver for the company and enjoined George E. Seeley, secretary and treasurer, from interfering with or taking part in the business until permitted by the court. The petition states that Clinkofstine, Seeley and Luther Beierwaltes are the stockholders and directors, that the company has enjoyed a profit of $3,500 which Seeley has "pocketed," that Seeley has refused the other men access to the books or to allow them to take a part in the business or to hold a directors' meeting, that Clinkofstine has contributed $300 to the business and that Seeley told Clinkofstine that if the latter ever came in the garage again he would kill him.

Two Indiana Cars in New Sales Company.

Indicating the close relationship existing between the American Motors Co. and the Marion Motor Car Co., of Indianapolis, over both of which J. I. Handley presides, there has been organized in that city the A. & M. Sales and Service Co., capitalized at $2,000, which will market the American and Marion cars in Indiana, western Ohio, southeastern Illinois and western Kentucky. Handley is president of the new company; Thomas L. Marshall, who has been identified with Handley in the manufacturing companies, is vice-president and general manager, and L. R. Wilbur secretary and treasurer. Pending the erection of a building of its own, the Sales and Service company will be located at 517 North Capitol avenue, which at present is occupied exclusively by the American agency.

GOOD-BYE TO E-M-F AND FLANDERS

Studebakers Obliterate Those Names from Their Slate—Means Adopted to Assist Obliteration.

Hereafter the titles "E-M-F 30" and "Flanders 20" as applied to cars produced by the Studebaker Corporation, of Detroit, and as far as they apply to any other department of the Studebaker business, will remain but memories, and not wholly pleasant ones. They have been entirely obliterated from the Studebaker slate. As the Motor World stated last week, the Studebaker Corporation is supplying new nameplates for their old cars which bear the E-M-F and Flanders titles, and it since has transpired that such action is but one of the means whereby the Studebakers mean that henceforth the name Studebaker shall be the only one known in their establishment.

The title E-M-F was acquired when the E-M-F company was purchased some three years ago, at which time Walter E. Flanders also was acquired. Later, a 20-horsepower car was developed and the name Flanders applied to it, and it was so cleverly exploited by the man or men who later proved disloyel to the Studebaker interests that the name Studebaker was forced into the dim background. The exploitation of the name Flanders also was carried to very unusual lengths, likewise at Studebaker expense, but with the housecleaning that followed the awakening of the big corporation, every effort now is being made to counteract impressions which had gone abroad. In other words, the Studebakers now are dominating their own establishment and every part of it.

N. A. A. M. Summer Truck Show in Doubt.

It still is an open question whether the midsummer open air truck show suggested by the National Association of Automobile Manufacturers will come to pass next year, as at the last meeting of the executive committee of that organization, which occurred at the country home of General Manager Miles in Clifton, Me., it developed that the sentiment for and against the proposal is about evenly divided. The association's show committee was instructed to make a further canvass of the trade in order that a definite decision may be reached at the September meeting. It transpires that the plan in view contemplates not merely an exhibition of trucks, but a practical demonstration of loading and unloading systems, transportation systems and other contrivances of an educational nature.

Spades to Make Parts in Kalamazoo.

The Spade Mfg. Co., capitalized at $50,000, has been organized in Kalamazoo, Mich., to manufacture automobile engines, universal joints, transmission gears, etc. It is composed of Herbert O. and Henry E. Spade, C. Lansing Major and Oliver Colman, all of Vicksburg, Mich., where the Spades have operated a machine shop for several years, and where they have turned out, in limited quantities, a universal joint of their own design. The Spade company has practically secured the plant of the bankrupt Burt Mfg. Co., of Kalamazoo, and as soon as it formally passes into their possession it will be equipped for its new purpose.

Keeton Completes Canadian Company.

Keeton Motors, Ltd., which was formed in Brantford, Ont., to reproduce Keeton cars for the Canadian and British trade, has completed its organization by the election of the following officers: F. M. Keeton, president; J. B. Detwieller, vice-president and treasurer; W. G. Houck, vice-president and sales director, and E. Sweet, secretary. Detwieller is connected with the Canadian Steel Co. and Sweet is a prominent attorney in Brantford. Among the directors are W. J. and Percy E. Verity, of the Verity Plow Co., which is closely affiliated with the Massey-Harris Co. and which is the largest manufacturer of plows in the British Empire. Keeton Motors, Ltd., is incorporated for $200,000, and has acquired a plant in Brantford affording 30,000 square feet of floor space. About 350 Keeton "sixes" will be manufactured to meet this season's requirements.

Edwards Secures Plant on Long Island.

The recently organized Edwards Motor Car Co., of New York, finally has chosen Long Island City, N. Y., as the scene of its operations. It has acquired what is known as the Blanchard property on Borden avenue, which will be extensively altered to meet its needs. When the work of remodeling is completed and the manufacture of Edwards Knight engine cars and trucks actively will be undertaken, 100,000 square feet of floor space will be available. The Edwards location is in the vicinity of the Ford service station and near to the site on which the Goodyear Tire & Rubber Co. will build.

Oil Company Sues Out Attachment.

The New York & Pennsylvania Co., an oil producing concern, on Saturday last, 3rd inst., sued out an attachment against the United States Motor Co. on a claim of $17,198.73 and filed it with the sheriff of New York county. The attachment will take the course of several previous attachments secured by other creditors of the automobile company who refused to join in the extension granted by the majority.

Enlargement to Double Cutting Output.

The Clark-Carter Automobile Co., of Jackson, Mich., maker of the Cutting Car, practically has completed a four-story addition to its plant, which probably will be ready for occupancy on the 15th inst.; it will permit the output of cars to be doubled.

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THE MOTOR WORLD

PUBLISHED EVERY THURSDAY BY

The Motor World Publishing Company

1600 BROADWAY, NEW YORK, N. Y.

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Subscription, Per Annum (Postage Paid) $2.00
Single Copies (Postage Paid) . . . . . 10 Cents
Foreign and Canadian Subscriptions $3.00
Invariably in Advance.

Postage Stamps will be accepted in payment for subscriptions. Checks, Drafts and Money Orders should be made payable to The Motor World Publishing Co.

☞ Change of advertisements is not guaranteed unless copy therefor is in hand on SATURDAY preceding the date of publication.

Contributions concerning any subject of automobile interest are invited and, if acceptable, will be paid for; or, if unavailable, will be returned provided they are accompanied by return postage.

Cable Address, "MOTORWORLD," NEW YORK.

Entered as second-class matter at the New York Post Office, November, 1900.

NEW YORK, AUGUST 8, 1912

ROOM FOR THE ELECTRICAL ENGINEER.

When hot tube ignition was replaced by electric ignition and dry batteries were introduced into motor cars, their use necessitated a certain amount of electrical knowledge in order to ensure that proper connections were made. Later, the magneto came into general use, and though this required still more electrical learning, car manufacturers have experienced little difficulty in hurdling such obstacles as presented themselves. But now that the electric lighting and electric engine starting system looms so large, even more electrical learning is required, and it is not merely necessary, it is imperative.

The ignition expert who has made a specialty of "doctoring" ignition apparatus until the desired results are obtained scarcely can be expected to fulfil a similar position with regard to electric lighting and engine starting systems, for they involve entirely different problems, in which the wiring, the voltage and the current employed are quite distinct from anything which obtains in the ordinary ignition system.

Electrical apparatus which comes from its manufacturers in A1 condition, and most of it does so, will remain in that condition, provided it is properly installed. But there's the rub. If the installation is entrusted to ordinary hands, or even to hands which are familiar with ignition apparatus, there is grave possibility that errors may be made which will not be discovered until the car has been shipped from the factory; in fact, so many errors of the sort have been made, that the need for a remedy should be apparent to those most concerned. If the car manufacturer passes such discrepancies because he is unversed in the intricacies of electricity, the dealer, who knows even less about such things, scarcely can be expected either to smell out or to correct the faults. Eventually the discovery that something is wrong must be made, and almost invariably it will be made by the purchaser of the car, and then arises the howl, dreaded alike by maker and dealer.

The whole question resolves itself almost automatically into one affecting installation, and as the manufacturer of the equipment cannot be expected to supply to each automobile factory men familiar with the apparatus, to see that it is installed and working properly, it is up to the car manufacturer to acquire the services of a man who is qualified to supervise such operations. This means that there is a well-defined place for an electrical engineer, who is an electrical engineer in more than name, in every up-to-date factory where electrical apparatus other than that which has to do with the ignition system, forms a regular item of equipment—a fact which scarcely requires enlarging upon. When so many other engineers are employed for other work, surely there is room for one more whose services spell increased satisfaction.

THE MOTOR THAT IS ECONOMICAL.

It has been the dream of motor vehicle manufacturers to build motors so flexible as to make gearing unnecessary, except for exceptionally hard pulling. But while flexibility in a motor is an excellent attribute—more, it is essential—it is a fact that it is anything but economical to run a motor at all times under spark and throttle control, using the same gear regardless of grades and road surface conditions, because every gasolene motor is capable of its most economical operation at a certain speed, and the further this speed is departed from the greater the waste of fuel. Moreover, continuous high gear work necessitates a big motor.

Obviously, a motor sufficiently powerful to propel a car up a fairly stiff hill on high gear must be run at a very small fraction of its capacity on a level road and under the conditions that usually obtain in driving a pleasure car. Take, for instance, a touring car of average size with a motor of about 35 horsepower. While the full power will be necessary to ascend a good grade "on high," the car will run on a level road at fair speed with an expenditure of something like five or six horsepower.

It is undeniable that the gasolene motor now is a remarkably efficient machine, but it is unreasonable to expect it to maintain, when throttled down to one-seventh of its capacity, the efficiency of which it is capable at normal outputs. The most economical motor for a car clearly is one that can be run at an economical rate while the car is running under the conditions that obtain by far the greater part of the time; and of necessity such a motor must drive through gearing when heavy pulling must be done.

If gasolene still could be purchased for 11 cents a gallon the question of fuel economy would not loom quite so large; but with the price of the volatile liquid rising and the peak not yet in sight, the possibility of effecting a saving on what goes into the tank by curtailing what goes out of it assumes real importance, and it can be best attained by using a motor which, while incapable of doing high-gear stunts, will give any reasonable speed on the level and will climb any grade with the aid of, say, a four-speed gearset. The fact has been recognized abroad and American engineers cannot much longer afford to close their eyes to it.

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LEAKY TANK BOAT DEFRAUDS DEALER

And He in Turn Unknowingly Deceives His Customers—Indicating Undesirability of River Water for Fuel.

"It's all very well to jump on a dealer when the jumping is good and when the dealer has done something to justify that sort of athletics," growled one of the tribe, savagely, "but there are occasions when the poor devil ought to be spared at least long enough to set up some sort of a defence. Take a look at me, for instance. Do I look like a habitual criminal, or a bettle-browed villain, or any such thing?"

"Not any more so than usual," was the soothing reply. "What's up?"

"Well, you know I've been supplying gasolene to a lot of people around here for years and years, and never had any trouble of any kind—nothing that amounted to anything, anyway. Last week the regular tank boat came up to the pier and, as usual, I filled my tanks and barrels and proceeded to fill orders. Now, it happened that the confounded oil boat had sprung a leak, all very quietly, and I had cheerfully filled my various receptacles with pure East River instead of the usual essence d'Rockefeller. I sent out about a dozen barrels and twice as many cans of the blamed stuff, and the next day this section of New York was marked by a series of ascending spirals of blue, sulphurous vapor, each marking the location of a stalled motor car, truck or stationary gasolene engine It was not long before the letters began to come in, together with samples of perfectly good sea water, returned cans and barrels and even howling customers who thirsted for my gore. Oh, all right! Laugh, d—n you, if you want to; I don't see anything funny about it. I have lost at least half a dozen customers and half my reputation, and I don't know yet just where I'll get off. It's all very well for a man to get good and mad when something goes wrong that can't be helped; but to my way of thinking it's carrying things altogether too far to make some unfortunate dealer, who is only a link in the chain and really is innocent, suffer severely in the financial region. That's just what's the matter with me."

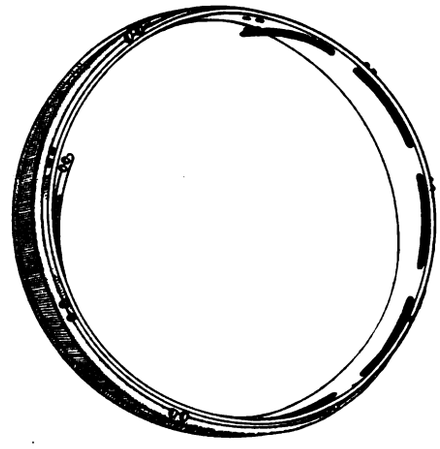
"Well, old man, you'll have to pardon me," said the Other Fellow. "But when I think of all those poor ginks whose jobs depend upon what they can do with their motors, trying to ignite nice, rich mixtures of air and water, and struggling to extract British Thermal Units from brine and atmosphere, and cranking and cursing their lives away on East River soup, why, you know, I just can't help—haw, haw!—smiling a little to myself; and—ho, ho!—when"——

The telephone directory happened to be the handiest thing, but it was secured only in time to give an added impetus to the rapid closing of the door. And it did not affect the truth of the story, either.

Q. D. Rim That Affords Safe Operation.

Facility of operation even though important, is not the only consideration to be met with in the designing of a rim of the Q. D. type, for numerous "flying ring" accidents which have been recorded—and more than one has proved fatal—would indicate that the safety of the device also should be considered. In designing the rim which it is about to place on the market, the recently formed National Rim Co., of Tarrytown, N. Y., capitalized at $150,000, has taken into consideration both points.

As shown by the accompanying illustration, the rim proper, which is made of pressed steel, is provided with one stationary flange which catches the beading on the



NATIONAL "Q. D." RIM

"inside" side of the tire. The rim is quite a bit broader than the ordinary rim, the extra width being made necessary by the ring locking device, which consists of ten springs bearing double bolts which protrude through holes made for their reception in the rim. A single pivot attaches the bolt bearing spring to the rim, so that when the bolts are withdrawn from the corresponding slots the spring can be slightly turned with the rivet as a pivot and the bolts prevented from re-entering the slots until all adjustments have been made. The ring which slips over the rim and catches the "outside" side of the bead is made solid. Obviously, when all of the bolts have been withdrawn, an operation which is very simple, the ring can easily be slipped over or off of the rim, as the case may be. When in place, the springs are turned until the bolts are in position to re-enter the slots, when they are released. The bolts protrude through the slots and prevent the ring from slipping off.

Satisfaction that Leads to Neglectfulness.

"Why, it never gives any trouble; I hardly know I have one in the car," is quite a common way of expressing satisfaction with some item of equipment. It does not do, however, to carry the idea too far, for while it is all very well to "forget" things for a while, continued forgetfulness develops into neglect, and neglect begets trouble, and it is a whole lot easier to avoid trouble by not forgetting than it is to wait until suddenly and disagreeably reminded and then apply a remedy which, because of its tardy application, may be worthless.



August 8-9, Chicago, Ill.—Trade vs Amateur drivers' reliability run, promoted by the Chicago Motor Club.

August 8-10, Galveston, Texas—Beach races under the auspices of the Galveston Automobile Club.

August 8-15, Minneapolis, Minn.—Reliability tour of the Minnesota State Automobile Association to Winnipeg, Can., and return.

August 11, Jackson, Mich.—Track races under the auspices of J. A. Sloan.

August 24, Uniontown, Pa.—Hill climb under the auspices of the Automobile Club of Fayette County.

August 25, Columbus, Ohio—Two-hundred-mile track race of the Columbus Automobile Club.

August 26-27, Flint, Mich—Track races under the auspices of E. A. Moross.

August 30-31, Elgin, Ill.—Road races under the auspices of the Chicago Automobile Club and the Elgin National Road Race Association.

September 1-2, St. Louis, Mo.—Track races promoted by the Universal Exposition Co.

September 2, Washington, D. C.—Motor truck parade conducted by the Washington Post.

September 2-3, Indianapolis, Ind.—Races on the Motor Speedway, promoted by the Indianapolis Motor Speedway Co.

September 3-6, Chicago, Ill.—Chicago Motor Club's reliability run for commercial vehicles.

September 7, Hamline, Minn.—Track races promoted by the Minnesota State Fair Association.

September 7-9, Santa Clara, Cal.—Road races under the auspices of the Santa Clara County Fair Association.

September 17, Milwaukee, Wis.—Grand Prize road race under the auspices of the Milwaukee Automobile Dealers' Association.

September 21, Milwaukee, Wis.—Vanderbilt Cup race on the Greenfield course, under the auspices of the Milwaukee Automobile Dealers' Association.

October 7-11, Chicago, Ill.—Chicago Motor Club's reliability run.

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KEEPING 200,000 OWNERS CONTENT

Some of Ford's Methods That Assist the Purpose — Facilitating Prompt and Reasonable Service — Salesman as Final Inspector.

"Keeping the owner satisfied" professedly is the object of every man who manufactures automobiles or sells them; it is but another way of expressing the word "service," which rolls easily off the trade tongue, but which too often is but an empty expression, when it is not a means of practicing more or less genteel extortion.

When one obtains a high price for his product, it is logically easy to render service, as the owner understands the word; the manufacturer's profits or the dealer's profits are sufficiently ample to permit of it. When one produces a truly popular priced car, and produces it in tens of thousands, on the face of things the margin of profit is so narrow as to suggest that the service rendered purchasers of such cars must be of corresponding proportion.

That the suggestion loses force when applied to the Ford Motor Co., at least, is fairly well known. Keeping the owner satisfied is the underlying principle of the Ford company, and how well it has operated is effectively illustrated by the fact that during the current year the Ford factory in Detroit has turned out in excess of 80,000 cars, and is being primed to produce twice that number for the 1913 market. As the overwhelming proportion of the demand is for those Ford models which list at less than $700, it is obvious that, despite a comparatively slender profit, where the will exists to satisfy owners the way can be found.

Every man who has to do with the sale of Ford cars has been forced, when necessary, to absorb the cardinal principle of the Ford doctrine and, though it already is carried unusual lengths, when the Ford assembling plants are established in the dozen or more cities which have been selected for the purpose even present conditions will be improved. At this moment but two such plants are in existence—one in Long Island City, N. Y., the other in Kansas City, Mo.—and as a matter of fact neither of them are yet more than service stations. Such assembling as has been done has been of an experimental nature and designed to prove the practicability of the far-reaching plan which has been adopted and which will be ripened within the course of the next few months.

How the Ford Motor Co. has sold more than 80,000 cars during the present year and expects to sell twice as many next year, constitutes both an interesting and instructive story, for such a state of affairs implies that upwards of 200,000 owners have been kept in a satisfied frame of mind, and surely that is a marvelous accomplishment in itself.

A general idea, at least, of the manner in which such results are obtained is made fairly clear by the methods in vogue in the Long Island City establishment, a substantial, well-designed, well-lighted, well-ventilated structure, to which four stories are about to be added in preparation for the assembling operations which are to be put into effect.

The Long Island City depot, like the New York City branch, is under the management of Gaston Plaintiff, one of the genuine veterans of the industry, who for eight years has been a member of the Ford staff, and who is thoroughly saturated with the keep-the-owner-satisfied policy.

First of all, the price of parts, which constitutes that avenue of extortion which so often is traveled and which as often, and not unnaturally, is a source of grievious and widespread dissatisfaction and ill will, is rendered practically impossible in the Ford organization. When a Ford car is purchased, the owner is supplied with a copy of the price list of Ford parts, and the price of the many parts are so proportioned that the total closely approximates the list price of the car itself, which prevents misunderstanding or complaint on the part of the owner and overcharging or extortion on the part of any dealer who may be so inclined.

In the Ford company's Long Island City service station the supply of parts is uncommonly large and complete and so kept in metal and fireproof bins, so arranged and indexed that even a novice can find any specified part without trouble. When parts are desired they are supplied instantly. Telegraphed orders which reach the New York establishment up to 5 P. M. each day are filled that very day, even if it be necessary that a special trip to the express office be made for the purpose. Similarly, no order which reaches the establishment by mail up to 3 o'clock is permitted to lay over until the next day. Repair work is executed with equal promptitude, and with the effort to prevent delays, misunderstandings and dissatisfaction which is interwoven in the Ford fabric, no hit-or-miss tactics are countenanced. When a car is delivered for repairs, a written estimate of the parts and the work necessary, and the price thereof, is submitted to the owner, and before the work is performed the owner is required to append his signature to still another blank, which constitutes a specific order for specific work. This system leaves no possible room for misunderstanding. The owner knows exactly what he will receive and what he must pay, and it may be added that the price of Ford repairs is the price that pleases.

"If, in going over a car," said Plaintiff, in talking of this department of his business, "we find a part which should be replaced under our guarantee we do not wait to have our attention called to it; we remark the fact to the owner and renew the part without cost, and, believe me, we have found that owners do not lack appreciation of this attitude on our part. When a car is sent to us through an agent for replacement of a guaranteed part, we adhere to Mr. Ford's policy of keeping in touch with the owner. We look up the motor number, the date of the sale and the name of the purchaser and, while we are liberal as to dates, despite the period of our guarantee, we always write the owner and ask him whether the car in question is his own and when the repair is finished we again address him, informing him that the part has been replaced and telling him there will be no charge therefor."

"Yes," laughingly admitted Plaintiff in reply to a question, "a few agents have taken offense because of our thus going directly to the owner, but they are few in number, and practically all of them now understand that it is merely a part of our policy and that it works to their advantage in the end; that is to say, they understand that it conveys to owners the fact the Ford factory really does stand behind Ford cars and that if an owner bears good will toward the manufacturer of the car the dealer sells he cannot but feel kindly disposed toward the dealer also."

The performance of repair work on the Ford system as exemplified in the Long Island City service station is well thought out and admirably conducted. Each repairman is an expert in a particular direction. Thus, certain men have to do with engines only, others handle rear axles, still others transmission systems, and so on throughout the establishment. And no repaired car is permitted to leave the place until it actually has been subjected to a road test, if not two of them, for whenever possible the owner is taken out in his car before it is delivered to him, in order to insure his personal satisfaction. When the road test demonstrates that the repairs have not been all that they should be, the car is sent back, and even though it be necessary that it again be completely dismantled, the charge therefor is not billed to the owner; the company bears the loss, as, indeed, should be the case.

In addition to the regular force, the Ford service station also maintains an emergency repair force which handles such cars as require immediate attention, and the work on which requires dispatch in order to satisfy the owner. This emergency force serves to prevent delaying work which is going through the plant in regular order. It also assures tourists who stop at the Ford door the sort of attention they require and which serves to send them happy on their way. Such attention to tourists is one of the strong cards in the Ford hand. Nothing is permitted to stand in the way of their receiving instant attention.

When it was suggested that lack of final inspection, or lapses in final inspection, are a prime cause of dispute and dissatisfaction on the part of owners and that it is a

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failing in most repair departments, Plaintiff admitted as much.

"Competent final inspectors," he said, "are rare 'articles.' Like everyone else, we have had our troubles in finding them, and I have come to believe that the chief reason for their rarity is that men who act as inspectors are men who have had to do purely with things mechanical and who know nothing of the temper and temperament of car owners. They seldom come in contact with them and, therefore, may not be wholly to blame, but that does not lessen the unpleasantness which accrues from that condition or state of mind. Within the last month, however, we have tried an experiment which seems to hold abundant promise and which, in fact, already has shown results. Instead of a man trained in a factory or a repair shop, we are employing one of our salesmen as our final inspector. Of course, he is well informed regarding the mechanism of our car and knows just what's what in that respect, but he has come into such close and frequent personal contact with owners that he knows their failings, the arguments they present and what they expect or require, and he, therefore, seems better able to pass judgment when a car is submitted for his inspection than does a purely factory-trained man. We are not yet ready to say that we have thereby solved the problem of final inspection, but results make appear that we are on the right track."

Enormous Extent of Petroleum Production.

According to statistics compiled by the United States Geological Survey, the amount of petroleum produced in the United States during 1911—220,449,391 barrels—surpassed the record of the previous year by very nearly 11,000,000 barrels, a percentage increase of 5.2. The total production of the world also surpassed all records, amounting to over 345,000,000 barrels, and of this the United States produced in the neighborhood of 63 per cent. The value of the production of this country, at the average price of 60.8 cents a barrel which prevailed, was $134,044,752. Distillation yields about 15 per cent. of crude oil as gasolene and napthas, which are utilizable as motor fuel, so that if all the crude oil produced had been refined the total output of motor fuel for the year could have reached 1,653,370,432 gallons, at 51 gallons to the barrel.

Palmer-Moore Engines for Truck Use.

The Palmer-Moore Motor Co., of Syracuse, N. Y., which, as everyone does not know, is controlled by John N. Willys, of Toledo, O., is putting through its works five trucks which will be equipped with the Palmer-Moore engine. The engine itself is of the two-cycle air-cooled type and has three cylinders. It differs from other two-cycle motors, however, in that rotary intake valves are employed, the object being to vary the quantity of mixture admitted according to crankshaft speed.

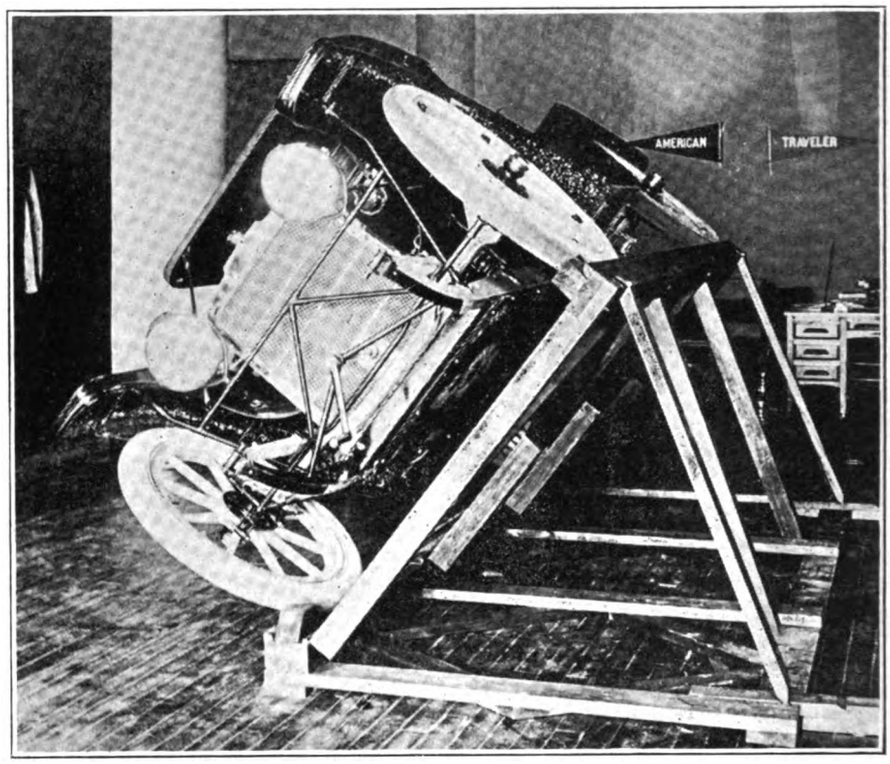
WHEN A CAR WILL NOT CAPSIZE

Effective Salesroom Demonstration Proving Stability of Underslung System—Car Safe When Tilted Four Feet.

Low center of gravity in a car means stability under conditions that tend to make the machine turn turtle, such as running two wheels on one side of the car high on a bank, or, what amounts to the same thing, dropping two wheels in a ditch. The feeling of security that accompanies the knowledge that a car is endowed with great stability tends to add not a little to the comfort of motoring, to say nothing of the actual advantage of a low center of gravity in an emergency, and if there is one car that more than another takes full advantage of these facts it is the American underslung, the manufacturers of which, the American Motors Co., of Indianapolis, Ind., inaugurated the underslung system.

That statements regarding the stability of the underslung cars are something very much more substantial than mere empty claims is indicated by the accompanying illustration of an American salesroom demonstration, which shows one of the American cars tilted at an angle of no less than 55 degrees without turning completely over, although when the car was being placed in position it was hoisted to an angle of 60 degrees without upsetting.

While the illustration of the demonstration is sufficiently impressive in itself, the figures designating the angle of 55 degrees mean but little to persons unaccustomed to the measurement of angles; but anyone can appreciate what it means to lift the two wheels on one side of the car nearly four feet from the ground without capsizing the machine. This is what was done in the case in point; a simple calculation shows that at an angle of 55 degrees the wheels on the raised side were just short of 46 inches higher than the lower wheels.



DEMONSTRATING AMERICAN UNDERSLUNG STABILITY—THE ANGLE IS 55°

Bubbling Fountains in a Tire Factory.

By the installation of no less than 53 fountains, through which a supply of fresh, cool spring water is constantly bubbling, the Goodyear Tire & Rubber Co., of Akron, O., has solved the problem of the summer drinking supply for 5,000 workmen, fulfilling the requirements of sanitation as well as of efficiency. The water is circulated through a system of galvanized iron piping covered with cork insulation to a thickness of half an inch. If this proves insufficient to keep the water at a low temperature, it is planned to install a refrigerating plant for the purpose. The new drinking water system replaces a veritable regiment of pails and tubs in which water forwerly was carried from hydrants to various parts of the works. The company also maintains a private reservoir and a series of bath houses for its employes.

Bent Valve Stems Beyond Remedying.

There is little use trying to do anything with a valve the stem of which has been bent even slightly. While it may be possible to get it straight, it is a difficult matter; the best way is to replace it.

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REILLY'S DEBUT AS A CONFEREE

How a Dealer Helped Place Business Before a Hobby—When the Conference is Advantageous and When it is a Business Burden.

August sunshine and the scent of the bouquet on the ante-room table meant nothing to Reilly; nor was the breeze from the electric fan at all conducive to a lowering of his mental temperature. On the contrary, they served only to increase his irritation as he "cooled his heels" beyond the outer bulwark of the automobile factory's office, and since he sat with the breeze blowing from his right side, it lifted one by one the long, straggling hairs which he carefully smoothed over from the left side of his near-billiard-ball cranium and dropped them over his left ear; and every time a hair tickled his ear he became more uneasy. Uneasy, however, was a mild word, and the sight of the calm, gum-chewing telephone girl who had told him to wait in the ante-room aroused such a smoldering wrath that, had she been a man, he would have been tempted to choke her at least once, just for luck.

Reilly, although his name might indicate that he was a contractor or a metropolitan policeman, was a smart little business man, and at the factory he was rated as one of its best dealers, although his field centered in a small city some thirty or more miles from the municipality of more than a half-million population where the factory turned out its several thousand cars every year. Because he was such a good seller of cars he thought he was entitled to some consideration; anyway, he failed to perceive why any man who called on business should be accorded the reception meted to him. As near as he could ascertain, there must be big doings around the factory, for there seemed to be an unending succession of conferences which were the stumbling blocks in Reilly's pathway.

It was the time of the year when factories grow anxious about their line and their dealers for the coming season, but Reilly was no cause of worry, for so good was his business that, instead of being pursued, he generally dropped into the big city and signed up in about ten minutes. That was what he was trying to do now. Four times within two weeks he had made the call for the purpose of signing up. The first time he was told the sales manager and other high and mighty ones of the organization were "in conference"; how long it would last the telephone girl said she did not know; so Reilly waited a half-hour and left with the intention of dropping in again and completing the business. The second, third and fourth times Reilly throttled down at the factory door he was given the same old story about the sales manager being "in conference," and not having forgotten the wasted half-hour of the first occasion he lost no time in waiting.

This was the fifth time he tried, and he and the telephone girl felt almost acquainted, and when she smiled wearily and said the sales manager was "in conference," Reilly's Gaelic blood gave an ungovernable surge and he ejaculated "Damn the conference!"

"I almost agree with you," unexpectedly vouchsafed the girl.

"Well, we'll see whether I see the sales manager or not," was his decisive comment. "I came up to-day to see him, and I'm going to see him if I have to wait until next year's cars are out." So he had waited. It seemed longer, but it really was an hour. About the time he had brushed his runaway hairs back for the twentieth time his active Gaelic temperature gave an upward jump —and so did Reilly.

"Say," he accosted the telephone girl, "when do these conferences generally end?"

"Can't say. Sometimes at one time and sometimes later."

"Well, where are they held?"

"In the directors' room."

"Where's the directors' room?"

"It's the third door down the hall on the left, but there are strict orders that men in conference are not to be disturbed."

"Oh, they aren't! Well, just watch the champion disturber," and before there was time for the spread of an alarm over this breach of office discipline, the irrepressible Reilly went down the hall with his foot on the accelerator, figuratively, and the cut-out open, and without even a knock he marched into "the conference."

"Can you wait outside a minute, Reilly?" mildly inquired the sales manager, as the invader halted at the table's edge. "We're in conference just now."

"O, you are?" retorted Reilly. "Well, so am I. I just came in. Didn't you see me? I came in through the door, and I don't know but I'll stay."

"What's the trouble, Mr. Reilly?" soothingly said the vice-president. "Why the hurry?"

"Well, I'll tell you, if you want to know; I'll invite myself into the conference and tell you people a few things you don't know. I honestly think someone ought to tell you, and I guess I can do it, even if I was a trifle warm about the collar buttons when I came in."

"Anyone who has suggestions as to how to improve the business is welcome to our conferences," remarked the vice-president.

"I'm full of suggestions," said the dealer, "but first I would like to know what in hell all these conferences are about. I have been here five times on important business. I have come to sign up for next year, and, incidentally, to hand the sales manager a little information about certain territory that will be worth considerable to him. It's stuff I've got to tell; I can't write it—and where do I get off? The first time I came you were 'in conference,' and I roosted on a seat outside for a half hour; and the second time I came you were 'in conference,' and it was that way every other time. This is the fifth time I've been here, and I waited an hour and then I got a bit hot and decided to see the sales manager if I had to kick in the door.

"While I've been waiting during these several days I've heard your telephone operator repeat 'He's in conference' over the wire until my ear drum aches, and I've seen a regiment of people lined up outside the railing. There was a man from one of the steel mills to see the vice-president, and he waited a while and went away. Half a dozen men were in to see the advertising manager, and there were a lot more that I don't know who they were or what they wanted, but they all seemed to have an idea that the company is on the verge of bankruptcy or something else, for several of them talked as if they had been here before and stacked up against this 'conference' proposition, and I myself haven't been able to figure it out. Now, honest, tell me, what's it all about?"

"It seems to me," replied the vice-president, "that you have a wrong idea about things. We aren't going into bankruptcy, and we are having no particular trouble. We have, however, inaugurated a plan of conferences; every day the heads of some of the departments meet with the officers of the company and such other men as are essential to a discussion of the subject in question, and we have a big family talk wherein each man advances his own ideas, and we work for a system of greatest efficiency."

"For instance, and if it's any of my business," boldly asked Reilly, "what were you talking about this afternoon?"

"We were discussing a plan to increase our list of dealers, as this season we expect to manufacture on a more extended scale and"——

"Pardon me for 'butting in'; but while myself and several more are waiting in the front hall to get a chance to be dealers you men are in here figuring how to get us to sign up; do I get you right?"

"Well," parried the vice-president, "not just that way. I'm afraid you've misunderstood our motive."

"Right here," chimed in the secretary, "let me make a speech."

The secretary, be it known, was strong for results and short on system and such things, and with the independence born of a large holding of stock he had gained a reputation for kicking over pet schemes of the other officers, while all the time he, although some of the others declined to admit it, was the man who was putting the 'punch' into the organization. "I've been getting weary of these fireside meetings," he continued, "and I don't know but what Reilly is right. In fact, I know he has a pretty good business head and he can't be

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far wrong. We started this conference system about a month ago, as you all remember, and decided to meet every Monday afternoon to outline work for the week and to discuss whatever problems came up. You probably never realized it, but those conferences have increased in number, until this week we have been in session every day so far, and this is Thursday. I've been waiting to say something about it, but I wanted to be sure I had grounds, and now that Reilly has shown us how things are viewed from the outside and how these conferences are likely to affect our real business, I want to register a protest against them.

"I have made one or two quiet investigations. I have found that while the sales manager is in here work is piling up on his desk and he ought to be there attending to it. He is not at fault; we are. The stenographers in the advertising department, I'll bet a quarter, are holding a nice quiet conference on vacations or some other equally important matter, all because the advertising manager is called away from work he should be doing. And"——

"Do you mean to say," retorted the vice-president, "that these conferences are of no value, and that we ought to quit them?"

"No, no; you're wrong there. But can't you see we are doing too much conferencing? We organized this company to manufacture automobiles, and always did pretty well at it without this family circle stuff. Once a week, or whenever really necessary, is all right, but when we make a business of holding conferences, I think we ought to hire more men to do the work of the office and either organize a separate corporation to hold the conferences or let up a little on this stuff and let the present organization do a little towards looking after our regular business. Or, we might make business a side-line and make a feature of conferences, although I do not think our incorporation papers say anything about our being permitted to act as 'conference promoters.'

"I know that I, for one, have several important matters that require attention, and I should think some of these other conferees ought to have them, too. I move that we adjourn and meet next Monday to discuss the question of conferences."

"I suppose Reilly would like to have us adjourn so he can sign up," suggested the sales manager. "Wouldn't you, Reilly?"

"That's why I'm here," he replied.

"Well, what do you say?" asked the secretary.

Several of the other officers realized, unwillingly, that, as usual, he was about right and would have liked to have fought him into a corner, but they knew that when in a corner he fought his best: also, they disliked having one of the inevitable rows which would result if they opposed him, so they acquiesced.

Reilly was signed up and ready to go in fifteen minutes. On the way to the door he ran across the secretary.

"Say!" he blurted out, "what kind of a bunch have you got around here? I always though you were pretty sound, but the way you have been acting lately 'gets me.'

"S-s-s-s-sh," said the secretary, as he hurried away. "They're all right. Just another hobby; they have to corral one to ride just so often. But I'm glad you came, Reilly; come again some day."

As the fiery little dealer hurried out of the door with a pleasant good-bye nod to the telephone girl, she stopped chewing gum to stare at this strange man who waltzed all over the company's rules and went away smiling.

Corbin Improves Speedometer Dial.

One of the results of the recent acquirement by the Corbin Screw Corporation division of the American Hardware Co., of New Britain, Conn., of the Brown—now the Corbin-Brown — speedometer, is the new dial numbering improvement shown in the accompanying illustration. As will be observed, the number 10 and all its multiples



CORBIN-BROWN SPEEDOMETER

within the range of the instrument are made almost twice as large as the number 5 and its multiples, the object being to make the reading of the speedometer an easy matter even from a distance—from the rear seats of the car, for instance. This arrangement enables the speed to be read with considerable accuarcy even if the individual numbers cannot be distinguished.

The Corbin-Brown speedometer, which the Corbin company manufactured for the Brown Speedometer Co. before taking it over, is of the centrifugal type with a compound governor of extreme sensitiveness, by virtue of which the instrument is capable of indicating with accuracy speeds as low as two miles an hour. There are four governor weights, mounted in pairs, and the pairs are caused to approach each other by the action of centrifugal force, the indicating needle being moved, through a rack and gearing, in proportion as the weights approach or recede from each other. The mechanism operates with equal accuracy whether the car runs forward or backward, and this is true also of the odometer or mileage registering part of the instrument, which is operated by an eccentric and pawl so designed that it always works in the same direction, regardless of the direction of movement of the car; thus the total reading will include all the distance traveled by the car when backing. A distinguishing feature of the instrument is the brown dial with clear white figures.

Fargo Dealers Hold Tented Show.

Not a few of the 1913 models of various makes of motor cars were on view at the midsummer show of the Fargo Automobile Dealers' Association, which was held in the North Dakota town of that name Thursday, Friday and Saturday, July 24th to 26th, inclusive. In the single tent which housed the exhibit, ten different makes of cars were shown by seven dealers, as follows: Studebaker Corporation, Studebaker "20" and "30"; Moore Bros., White and Everitt; Fargo Ford Co., Ford; John Wyman, Cole; Pence Auto Co., Buick; Fargo Auto and Supply Co., Cadillac and Chalmers; Wheelock Auto Co., Overland.

New Basis Likely for Truck Insurance.

Information gathered by J. S. Marvin, traffic manager of the National Association of Automobile Manufacturers, chiefly through the Automobile Underwriters' Conference, which he attended, discloses that the insurance people have found that the fire hazard on trucks is greater when they are on the road than when they are in the garage. Accordingly the underwriters are planning to reclassify the insurance rates largely on the number of hours that trucks usually are on the road in different lines of business.

Big Plant for Kentucky-Made Truck.

The Stewart Iron Works, of Covington, Ky., which recently undertook the manufacture of a one-ton truck and whose plant was destroyed by fire, is arising from its ashes and in doing so will reconstruct its factory in such a manner that the manufacture of the truck will be greatly facilitated. A separate building will be erected for the purpose. It will be a three-story brick and steel structure, 100 x 450 feet.

Disco Branch Opened in Indianapolis.

The Ignition Starter Co., of Detroit, manufacturer of the Disco engine starter, has opened a branch in Indianapolis at 448 North Capitol avenue, with H. L. Morgan as manager. Incidentally, the Disco people just have closed a contract with the Buick Motor Co. for approximately 25,000 Disco gas starters, which will be standard equipment on all 1913 Buick cars.

Kalamazoo Contributes Fuel Economizer.

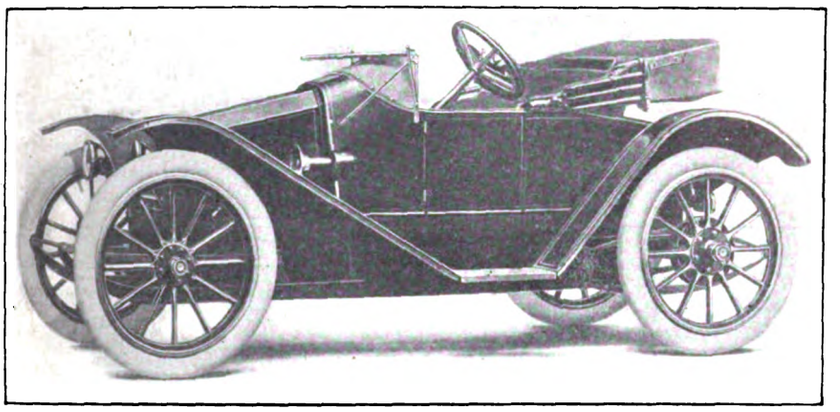
Bert Ethridge and E. W. Doty, of Kalamazoo, Mich., have formed the National Compression Mixer & Primer Co., in that city, which will manufacture a combined primer and gasolene economizer which is operatable from the dash of the car; it is the invention of Ethridge.

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MOST RADICAL OF ALL ELECTRICS

Church-Field at Last Ready for Market—Has Planetary Gears, Underhung Frame and Other "Gasolene" Features.

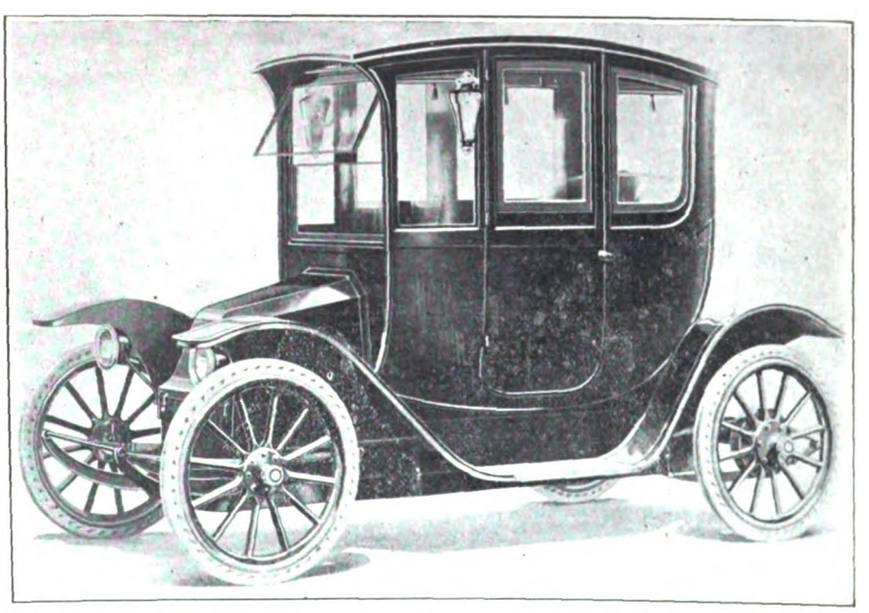
Taking a leaf—several leaves, in fact—out of the book of the gasolene automobile engineer and adding a number of patented and exclusive features of their own, the engineers of the Church-Field Motor Co., of Sibley, Mich., have developed a brand new type of electric pleasure vehicle which simulates its spirit-propelled cousin even to its method of control and the incorporation of a two-speed planetary change gear mechanism. Although first particulars of the new vehicle were divulged very late last fall, at which time they created more or less of a sensation by reason of the unusual features of the car, considerable experimental work remained to be done and it is only now that the development has reached the point where the exacting demands of the designers have been realized. Already a number of cars are on the road and plans for an ultimate season's crop of some 300 more are in operation.



CHURCH-FIELD ELECTRIC ROADSTER WHICH STRONGLY SUGGESTS GASOLENE

Barring the incorporation of the planetary gearset, which in itself is a radical departure from previous electric vehicle practice, the car numbers among its other unusual features a novel form of underhung spring and frame suspension which results in stability and easy riding qualities that throw interesting light on these problems, a brand new method of control, a new motor and a new controller. In fact, the car is new all the way through, though its features are not such as to warrant misgivings as to their ability to substantiate the claims that are made for them, but rather are in the form of modified designs which over long periods of service have given satisfactory service. In the fewest possible words, it has been the aim of the Church-Field company to make its electric car "an automobile operated by electricity," in which simplicity of construction and operation and accessibility are the keynotes in design.

The most unusual feature of the car is its planetary change gear mechanism, of course, and its raison d'etre best is made plain by reference to the fact that electric vehicle motors invariably are constructed to sustain for short periods overloads of approximately 500 per cent. over the normal current consumption on a level road. Which is to say, the ordinary multi-speed electric motor must be capable of exerting the same pull at low speeds as it does at high speeds. But it cannot be expected that a motor which is constructed to operate efficiently at a given mean speed will show as high efficiency at low speeds and heavy loads when the needle of the ampere meter climbs from its normal position at or near 15 amperes to approximately 150 amperes, as it does under normal conditions.



CHURCH-FIELD ELECTRIC COUPE SHOWING UNDERHUNG FRAME AND SPRINGS

Briefly, it was to supply a high average efficiency that the Church-Field engineers have adopted the planetary gearset. For instance, in the course of an afternoon's demonstration with one of the new roadster models, a 17 per cent. grade in the vicinity of the factory was climbed on direct drive, and though the car went up the grade with surprising alacrity the needle on the ampere meter pointed to about 150 amperes. Immediately afterward the same gradient was climbed, using the low gear, and though there was scarcely any diminution in the speed of the car the amperage drawn by the motor fell off to a little more than half what was required to make the climb on high gear. The usefulness of the gearset is not confined to the climbing of grades, however, and is equally valuable in starting, when the current drawn by the motor generally is high, and in running through sandy or otherwise "heavy" roads. Inasmuch as the current consumption is reduced under such conditions when the low gear is used, the touring radius of the vehicle is increased proportionately. Another of the noteworthy features of the gearset is that there is virtually no "dead point" in it. That is to say, by reason of its construction, which is covered by patents, the shift from low speed to direct drive, or vice versa, can be made without effecting the continuity of torque at the driving wheels. Consequently, the drive always is smooth, and the jerk and jar which might be expected when gears are changed is conspicuous by its absence.

In working out the spring suspension of the car, the necessity for the maximum stability combined with easy riding qualities and an ability to reduce the shocks transmitted to the mechanism and the passengers by inequalities in the road surface, have been the prime considerations. In order to achieve these ends, the frame of the vehicle has been suspended below the axles, thus lowering appreciably the center of gravity of the car, and a unique type

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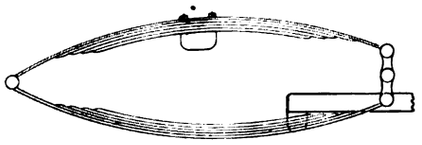
of rear springs and method of drive has been employed. The front springs are of the conventional semi-elliptic variety, and though the rear springs are of the scroll full elliptic type, the lower halves are virtually turned inside out and are attached to the frame and axle in a manner that permits of a cantilever action and results in shock absorbing properties that are excellent. The two halves of the rear springs are arranged one over the other under the axle to which only the top half is attached. The lower halves of the springs are attached to the frame of the vehicle at a point a few inches from the forward end of the spring itself, the exact construction being best made plain with the aid of the accompanying sketch. The drive is through the front halves of the upper members of the springs, the whole arrangement being original with, and exclusive to, the Church-Field cars.

The motor which is used is built by the Wagner Electric Mfg. Co., of St. Louis, Mo., to the Church-Field company's performance specifications, and is of unusually high efficiency; the nominal horsepower rating is four, though on a brake test over seven horsepower has been developed. Electrically, the motor is rated at 40 volts and 60 amperes. Indicating the length to which the features of accessibility and simplicity have been carried, the motor and planetary gearset form a rigid unit which is supported at three points in a sub-frame. Even with the body in place on the chassis it is possible, by the removal of a single bolt, to tip the motor and transmission for the reason that it is supported on trunnions. As a matter of fact, this feature of accessibility is one than marks the car throughout. For example, the motor and gearset, the resistance plates, the controller, the batteries and the rear axle may all be disassembled quite easily, without the necessity for removing the body.

On the roadster and coupe, 28 and 26 cells of standard 15 or 17 plate battery, respectively, regularly are supplied, 24 cells of 19-plate battery being optional where greater capacity is desired. Another of the unusual features of the vehicle is that the batteries all are arranged to be both charged and discharged in series. Inasmuch as the motor also is of the series type, the speed control through the entire range is smooth, and is unmarked by violent jerks and jars generally occasioned when the strength of the current is altered to suit the requirements of touring speeds.

The current control is entirely by drum contacts and the speed control is by plate segments, the two being operated independently, and the whole control mechanism requiring the minimum of exertion on the part of the operator by reason of the fact that it is mounted on ball bearings. As already has been pointed out, the batteries are connected in series for all speed points, of which there are no less than 10. On the first three points series resistance is used; on the fourth point, the motor has straight series connection with the batteries, and from the fifth to the tenth points the motor fields are shunted by resistance. By reason of the wiring arrangement it has been demonstrated that with the controller in any of the notches above the fourth, the efficiency is well above 80 per cent. The controller itself, for which patents have been asked, is carried on the right side of the chassis in a cast aluminum housing which is closed by means of an enameled pressed steel cover. Consequently it is impossible for dust, dirt, oil or water to interfere with its proper operation.

In designing the control apparatus, it has been the object of the manufacturers to produce a simple arrangement following somewhat along the lines that are used in gasolene cars, and to this end the controller handles have been mounted atop the steering column. There are two levers, the one at the left, which is equipped with a



CHURCH-FIELD CANTILEVER SPRING

Yale lock, controlling the current and providing neutral, on and charging positions, and the one at the right, which is within easy grasp of the operator's fingers, controlling the 10 forward and reverse speeds. These two levers are arranged to correspond to the spark and throttle levers in a gasolene car. The same simplicity obtains with regard to the lighting circuit, which is controlled by means of a single switch, movement of the switch handle permitting combinations of any or all of the lights.

The steering gear is of the irreversible worm and sector type, control in the case of the roadster being by means of a hand wheel, and in case of the coupe by means of the conventional side lever. The wheel base of the car is 100 inches, and the tire equipment may be either pneumatic or cushion, Motz clincher tires being standard for the coupe model. When pneumatic tires are specified, the size regularly supplied is 36x4 inches.

In general lines, the Church-Field electric is quite similar to its gasolene prototype, the effect being heightened by the large wheels, the fenders, the underhung frame and the control elements. Seats are exceptionally roomy, and the dash of the car has been kept as "clean" as is possible under the circumstances; it mounts only the volt and ampere meters, the electric lighting switch, the speedometer and an eight-day Swiss clock. The bodies themselves are constructed entirely of aluminum, thus reducing the weight to the minimum, which proportionately reduces current consumption and increases the vehicle's effective touring radius. The upholstery in each case is finished to suit the requirements of the purchaser. Storage space in all the models is liberal, particularly in the case of the roadster, which provides a large luggage carrying space at the rear, where there is ample room for side curtains, tire repair implements, tools, pump and jack, all of which are supplied with the vehicle.

Polson Increases Its Productions.

Two new accessories have been added to the productions of the Polson Mfg. Co., of Buffalo. They are an automatic folding auxiliary seat and a ball bearing windshield. The new seat is so constructed as automatically to lock as the seat drops down, and without other effort than the raising of the seat itself it automatically remains in the desired position when it is pushed up out of the way. The ball bearing windshield is made in 35, 41 and 44 inch width and any color or any type filling board. It is automatically set at any desired angle by a ball bearing lock. The Polson engine starter remains a leader in the Polson line and just has been improved to the extent that one turn of the rotary gas distributer on the back simultaneously turns a charge of gas into all the cylinders as well as into the intake manifold. This charging of both the intake and the cylinders is claimed to overcome any possibility of failure of the engine to start, provided a spark is obtained in the cylinders.

Using Monkey Wrenches and Fixed Kind.

It is so much easier to pick up a monkey wrench and adjust it to fit a nut than to select from a collection of such wrenches the proper "open-ended" wrench that the adjustable tool usually does a good deal more than its share of the work about a motor car. The trouble is, however, that the adjustment is not always carefully made, and nuts that are commonly removed and replaced with a monkey wrench are apt to betray the fact through rounded angles and a generally battered and worn appearance. It really is much better to use fixed wrenches, or open-ended wrenches, or solid-ended wrenches, just as the user may care to call them—or spanners, as they say in England—that will fit properly. Once the eye becomes accustomed to selecting the proper wrenches for nuts of given sizes, it takes less time than it does to adjust a monkey wrench, and the nuts will be much better for it in the long run.

Valve Grinding that Gives Poor Service.

Valves ground in with coarse grinding compound without finishing with the finer grades are apt to require regrinding sooner than if smoothly finished. The finer the finish on the seating the better the wearing surface will be and the longer it will last.

When a Lifting Jack is a Menace.

One of the most dangerous appliances to be found about a garage is a lifting jack that is out of order, so that it cannot be depended upon to sustain its load.

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PREMIER ADDS A "LITTLE SIX"

Rounds Out Line With Model Intermediate Its "Four" and Larger "Six"—Develops Forty-eight Horsepower.

In developing the Premier "little six," which forms the latest addition to the line of four and six-cylinder cars produced by the Premier Motor Mfg. Co. of Indianapolis, Ind., it has been the object of the manufacturers to produce a six-cylinder model which shall fill the gap left between the standard four-cylinder model and the heavier and costlier six-cylinder car which, during several seasons, has contributed materially to the Premier reputation for reliability. To this end the new "six" is essentially a smaller edition of its well-tried prototype, and in it are retained all of the characteristic features which have served as the distinguishing marks of Premier cars in the past.

By reason of its smaller size, however, its price is proportionately lower, the figure having been set at $2,600, which includes a complete dynamo electric lighting system, a pneumatic engine starting system and tire inflater, and such other items of equipment as a combination speedometer-odometer-gradometer, foot and robe rails, demountable rims, shock absorbers and tools, etc. Despite the completeness of the equipment, however, storage space for luggage still is liberal, running boards having been cleared by providing a compartment built into the dash for the accommodation of tools and spart parts.

The motor in the new car follows closely the principles of Premier design that have been laid down and adhered to in the other cars in the line. The cylinders are of the T-head type and measure 4 inches bore and 5 inches stroke, similar dimensions in the larger "six" being 4½ and 5¼ inches, respectively. At 1,400 revolutions a minute the new motor develops 48 horsepower on dynamometer test. In other essential elements, the "little six" closely resembles the standard "six," with the difference, of course, that the size of parts throughout is proportionately smaller. The wheelbase is 132 inches and the chassis is mounted on semi-elliptic springs in front and three-quarter elliptic springs in the rear. Wheels are of the standard artillery type, and are shod with 36 x 4½ inch tires both front and rear.

Start-Lite Evolves a "Junior" System.

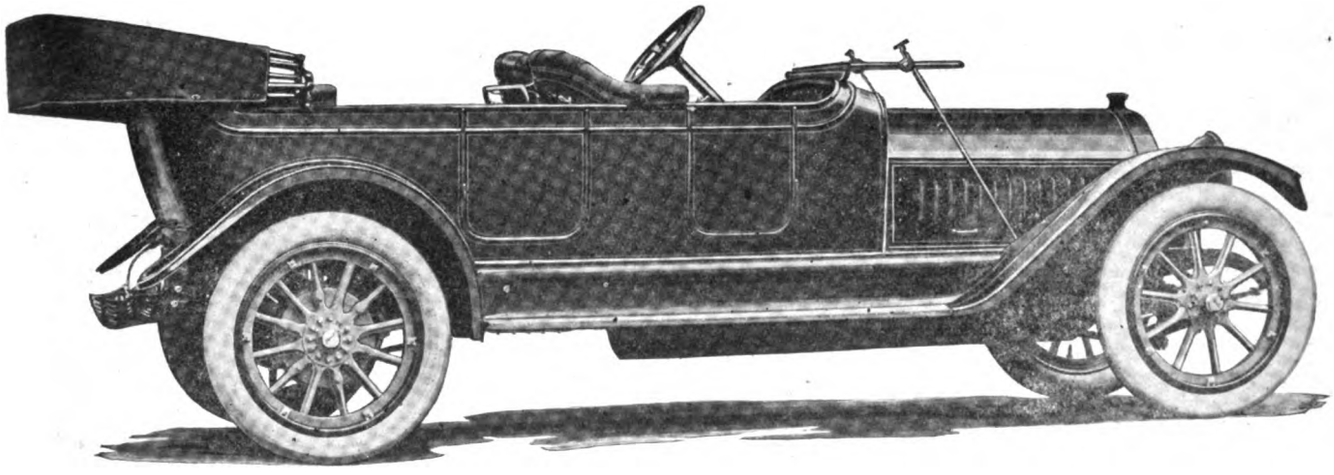
Having attained such success with its other products as to necessitate two increases in manufacturing facilities, the Start-Lite Co., of 1502 Michigan avenue, Chicago, Ill., which manufactures the Start-Lite compressed air engine starter and the Start-Lite acetylene lamp controller, just has placed on the market a new lamp lighter which is styled the Start-Lite Junior, the name serving to indicate that it is smaller and is designed to accomplish less than the standard lighter that has been on the market for some time. The new device is intended to be used with the the ordinary type of acetylene gas tank, and its purpose is to permit dash control of the head lamps only. In its esential elements, the new device is similar to the older one in that the gas is led to a dash valve through a tank reducing valve which maintains the pressure in the pipes at but a few ounces and thus reduces to the minimum the liability of leaks developing as the result of road vibration. The dash valve, which controls the flow of gas to the head lamps and permits them to be lighted, dimmed or extinguished, also acts as an electric switch. Immediately after the valve is opened a spark is caused to ignite the gas at the burners, the height of the flame being regulated by manipulating the valve. The list price of the new device is proportionately lower than that of the larger and older system, as might be expected from the appelation.

MISFIRING THAT IS MISLEADING

Symptoms that Make Magneto Appear Clearly Guilty When Fault Lies Elsewhere—Importance of Spark Gap.

If a motor misses fire, under certain conditions, when switched onto the magneto, but runs without a skip when the battery is used as the source of current, it may be imagined, and not without reason, that there is something wrong with the magneto outfit; and, as a matter of actual fact, the magneto often is blamed for such ignition trouble when the fault really lies elsewhere. To come straight to the point —both figuratively and literally—the difficulty is extremely likely to be at the spark gap of the plug, and the immediate cause of the misfiring often will be found in the excessively wide gap between the points.

When a motor is running at high speed the magneto also is running at high speed, and the conditions will be favorable to the delivery of a very strong, hot spark; the current will jump a gap of almost any reasonable width. If the motor is running slowly, however, the comparatively slow rotation of the magneto armature will produce a current of proportionately less strength, and partial or total failure to jump the excessively wide gap will result. There is still another condition that affects the jumping ability of the current, and that is the compression. With high compression the space across which the current will leap is considerably less than with low compression. Therefore it may easily happen that a motor will run without a single miss when moving quite slowly, as when on a well-paved street, because the throttle is partly closed and, as a consequence, the cylinders do not receive full charges; moreover, if there is any tendency to leakage of compression, it will be much more apparent at low than at high speeds. The low pres-



SIDE VIEW OF NEW PREMIER 48-HORSEPOWER "LITTLE SIX" TOURING CAR WHICH SELLS FOR $2,600

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sure existing when ignition occurs makes it comparatively easy for the current to bridge the gap. When the throttle is open, however, and the motor is taking full charges, even though it may not be running either faster or slower than in the last mentioned example, the compression will be correspondingly high, to the discomfiture of the somewhat feeble current generated by the slow-running magneto.

Thus it may come to pass that when the car is running along on the magneto, the road being smooth and level, there will be no missing; but should the throttle be quickly opened, the motor will miss and splutter until it gains speed, because there will be an increase in compression before there is an increase in magneto speed and current strength. Or, if the throttle is opened to give the motor more gas for climbing a slight grade, or pulling through a muddy or sandy stretch, without increasing speed, the missing will begin and continue until the speed increases or else the throttle is partly closed.

Obviously the spark gap must be made to suit the magneto current, and in making the adjustment the best possible plan is to follow to the letter the advice of the manufacturer of the magneto. It will be found that invariably magneto makers have very decided views on this subject, and, verily, they know whereof they speak. Most of them have emphasized the necessity for correct adjustment of spark plug points, but the lesson has not yet been as generally learned as should be the case.

Ohio "Six" to Appear in October.

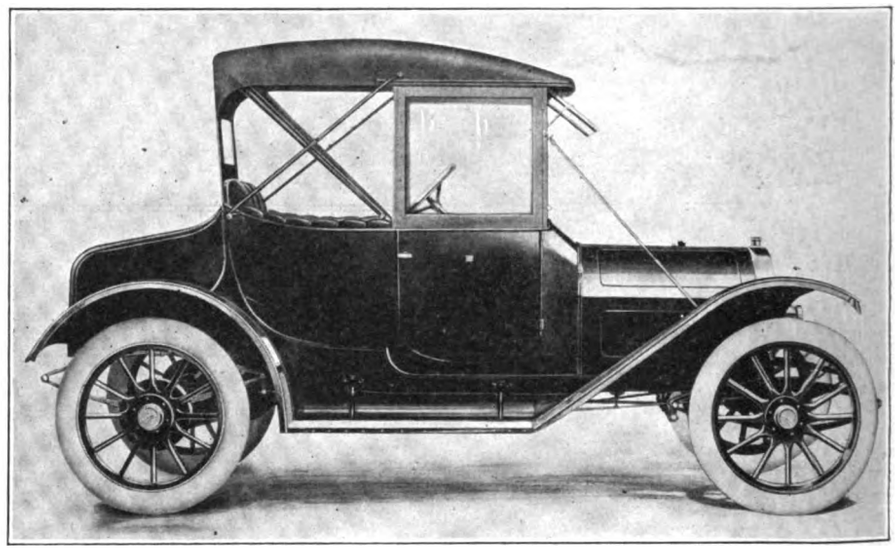
In common with a number of other makes of car to which the six-cylinder engine heretofore has been foreign, the Ohio line, which is manufactured by the Ohio Motor Car Co. of Cincinnati, in the state for which the company is named, for the first time, this year will include a six-cylinder chassis which has been styled the "Newport." Marking another departure from previous Ohio practice, the new car, which will be supplied as a seven-passenger touring car and a roadster, is of the left-hand steer and center controlled variety. In either touring or roadster form it sells for $2,500, which figure includes such items of equipment as an engine starter, a dynamo electric lighting system, demountable rims, tire irons, license holders, and so forth. Although the car is well in hand, deliveries will be delayed until approximately October 1st. In conformity with the tendency toward long strokes, the critical dimensions of the motor have been made 4⅛ inches and 5¼ inches, leaving little doubt regarding the class to which the engine rightfully belongs. The motor is combined in a unit with a multiple disk clutch and the change gear mechanism, the latter being of the selectively controlled type. The wheelbase of the new car is 138 inches, and both front and rear wheels are shod with 36 x 4½ inch tires fitted to demountable rims.

WAVERLEY'S GASOLENISH ROADSTER

Veteran Manufacturers of Electric Bring Out New Model of Modern Design—Indicates Altered Conditions.

Little by little the electric motor car has been shaking itself free of the imputation of being necessarily a conveyance for short distance work only. However limited the radius of action of the electric of earlier years may have been—and it was not exactly boundless—the electric of the present is capable of making long runs, and looks the part to perfection.

An excellent example of such cars is the new model 90 that just has been brought out by the Waverley Co., of Indianapolis, Ind., and which, as the accompanying illustration shows, is built along the lines of the popular type of gasolene roadster. The body is low-hung and the seat is deeply cushioned, with a high back; with the long wheelbase given the car—104 inches—the machine is extremely easy riding. The folding landau top is a conspicuous feature of the machine; affording ample protection when protection is needed, it nevertheless can be folded out of the way with very little trouble. The windshield is of the usual type; the glass panels over the doors are made to lift off easily, and the top folds back in the usual way. For touring, the space behind the seat affords storage room for a large amount of "dunnage," which is out of sight and protected from dust and the weather. A folding seat provides accommodation for a third passenger.



WAVERLEY ELECTRIC ROADSTER FITTED WITH LANDAU TOP

Mechanically and electrically, the new Waverley is similar to the 1911 roadster model, which distinguished itself by entering a tour with gasolene cars and which made the entire trip of nearly 1,400 miles without trouble except on the last day, when lack of charging facilities made it necessary to requisition the tow-rope for a few miles. The average distance per day was 113 miles and the maximum day's run was 157 miles. The car can be fitted with lead batteries of the ordinary type, or with Edison or Ironclad Exide batteries, as desired.

Unusual Test of an Engine Starter.

It is one thing to make a test of an appliance after careful adjustments have been made by way of preparation; but it is quite another thing to make a test unexpectedly, with no preparation whatever, as was done recently with the Delco electrical starting device on three Cadillac cars by officials of the English Royal Automobile Club. In order to make sure that no preparatory work had been done, the testing committee selected at random two cars from a shipment not yet unpacked—in fact, the cars were chosen while yet on the docks. A third was taken from the stock of the Cadillac agent in London. None of the three had even been equipped with storage batteries; but when the necessary sources of current supply were installed, each motor was started 1,000 times in succession without a single failure, a total of 3,000 successive starts from 3,000 trials. The machines were not fitted with starting cranks and received no tuning up of any kind. It is understood that further tests, relating to the ignition and lighting systems, will be carried out on the road under the control of the R. A. C.

When Valve Spring May Cause Injury.

The familiar scheme of putting a valve spring in place after compressing the coils and tying them together with string is all right and very useful, but a very disagreeable, and possibly serious, injury may result if the bindings let go while the spring is being held in the hand. For this reason care should be taken to use string that is plenty strong enough.

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LITTLE KNOWN FEATURES OF MODERN ELECTRICS

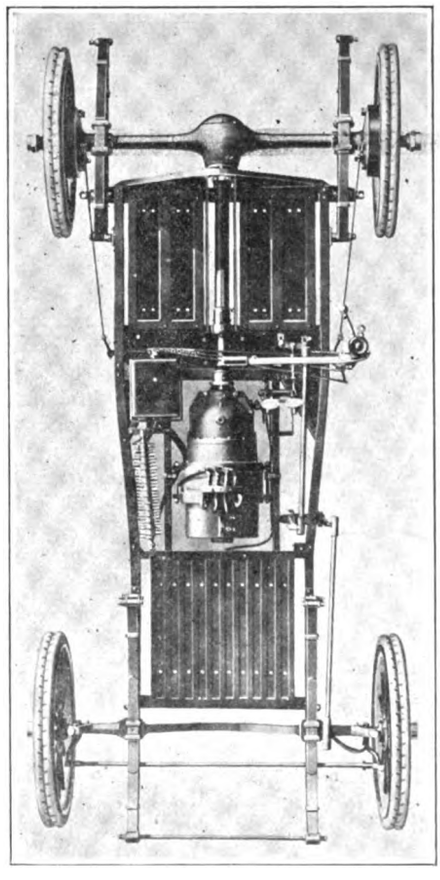
Simplicity That Is Masked by Ingenious Methods for the Protection of the Mechanism—Wherein Control Apparatus Differs and the Benefits That Accrue Under the Various Systems in Use—Motor Suspensions, Final Drives and Other Structural Details Contrasted and Made Plain.

Ever since old Ben Franklin, of historic, histrionic and gastronomic fame, first sent his immortal kite into the clouds during a mid-summer thunder shower and established the direct connection between lightning and electricity which previously had been only guessed at, scientists have been "fussing with" the fluid. Of course, scientists before Franklin had experimented with electricity in a desultory sort of way, but its commercial possibilities scarcely were realized until his notable discovery in 1746. Later—just 86 years later, to be exact—Morse electrified the world with his telegraph, and since then the swath that electricity has cut in commerce has been a wide one and one which is well illuminated with the brilliant achievements of experimenters. All of which appears as history in the well-thumbed text books of schoolboys.

Though electricity still is referred to as a "mysterious fluid," and little more is known of its actual make-up than was known in the days of Franklin and Morse, a whole lot more is known regarding the application and the possible application of it to commercial ends. Transportation, for instance, always has been, and at present remains, one of the greatest problems of civilization, and it is in this field that electricity has been made to serve one of its most useful purposes. It has been said by eminent railroad engineers that before many years have passed the steam locomotive for either long or short hauls will be practically unknown. Already many of the greatest railroads, both in America and abroad, have been electrified; others are preparing to take similar steps, and there is every reason to believe that even the most optimistic predictions will be realized. Incidentally, they probably will be realized in a much shorter space of time than is expected.

But the science of railroading legitimately may be expected to be beyond the pale of understanding of the average individual who generally experiences difficulty even in correctly deciphering time-tables. In the meantime, however, there is the problem of the transportation of freight—animate and inanimate—over the roads, and this undoubtedly is a problem that interests practically every one who has red blood in his or her veins, for, though the individual may have no inanimate freight to transport by means other than those afforded by excellent railroad facilities, the human race, as a rule, is nomadic and takes pleasure and increases its store of knowledge by wandering from its own fireside, so to speak.

It is doubtful if there are many persons who realize the giant strides that electricity has made in facilitating quick and easy road travel. The electric pleasure vehicle is comparatively well known, of course, though it is known in the majority of cases in a superficial sort of way that not infrequently has caused it to be dubbed



CHURCH-FIELD, SHOWING GEARSET

"a comfortable sort of a little vehicle for women's use, that lacks speed and won't go far." It is true that it is a comfortable little vehicle and that it is admirably suited for milady's use. But it can be made to run just as far, on one charge, or just as fast, as any gasolene vehicle. It cannot be made to do both at once, however, and it may have been this feature that has caused an undue prejudice against it. Neither of these factors of speed or unusual radius of action—within reasonable limits, of course—can be obtained in combination with vehicle efficiency, which lends point to the oft-reiterated statement that the electric vehicle, whether for pleasure or business, has a distinct field of its own.

Above all, and without casting undue or unjust slurs on the reliability of gasolene propelled vehicles, the electric is absolutely dependable, and it is this feature that has taken it out of the class of luxuries that serve no useful purpose other than to give pleasure to the owner and placed it in the class of necessities. The electric pleasure car is not a touring car, nor is it a racer; it is purely and simply a "service" car, and the service of which it is capable comes as a direct result of its simplicity and reliability. Due to the constant efforts of designers to simplify control, for instance, and to render the whole of the mechanism "fool-proof," the operator's greatest effort best may be put to leaving the mechanism of his vehicle intelligently alone.

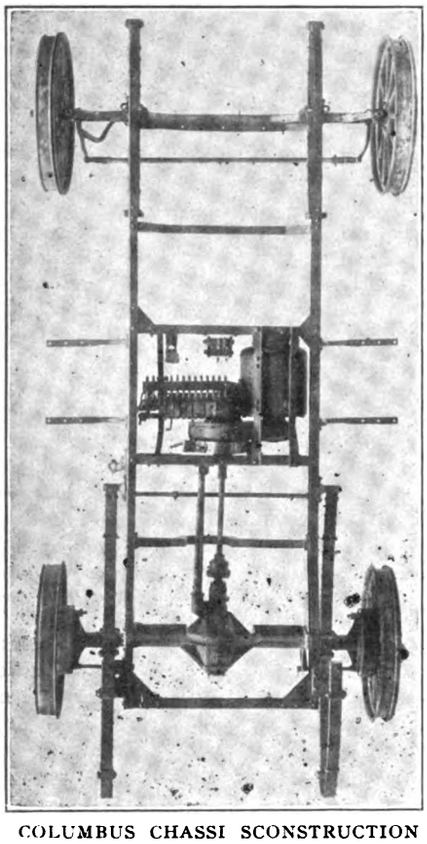
Just how the various makes of electric pleasure cars on the market have been refined, so to speak, in order that they may be left alone, indicates in some instances an amount of ingenuity that is astonishing and that is but poorly appreciated by dealers who do not sell electrics, and even by makers of gas cars, and withal, there is nothing terrifyingly difficult to understand about any of them. The operation of all of them fundamentally is the same: Current is stored in a battery; it is released to the motor by means of a controller; the motor turns the road wheels, and the vehicle goes its way until it is stopped by means of a brake. Nothing could be simpler. Each manufacturer, however, has his own particular method of ensuring the positive functioning of the parts, and it is altogether likely that if "electrics" were better known with regard to their distinctive features and the pains to which their designers have been to ensure ease of operation, efficiency and dependability, their increasing vogue would be considerably greater.

Naturally, methods of control—the manner in which the vehicle is started and stopped and held at the beck and call of the operator—form an interesting feature, for though it has been broadly stated that each is equipped with a controller that diverts the current in proper strength to the motor, and thereby causes the vehicle to start and to keep running, great variety in the form and arrangement of such essential parts obtains. Also a little variety obtains in the arrangement of the apparatus by means of which the vehicle is steered,

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though it is not as great as the variety in controller arrangements.

Following the general plan of the first self-propelled vehicles that were produced, the steering apparatus in a great many modern electric cars is virtually a modified tiller arrangement, the difference being that the tiller extends transversely of the chassis in front of the driver, instead of longitudinally to it. At present, however, there seems to be a well-defined tendency to get away from such construction and to substitute a wheel. Whether the tendency marks an effort to imitate the gasolene-propelled vehicle, which several manufacturers are frank enough to admit, or whether it does not, each method has its own advantages.



COLUMBUS CHASSI SCONSTRUCTION

Thus, for instance, the tiller arrangement permits the vehicle to be steered quickly and easily by means of one hand. Inasmuch as the other hand almost invariably rests on the controller, the advantage of the arrangement is apparent. With the wheel steer, on the other hand, a more rakish appearance is gained and the "electric effect," which seems almost without reason to have become disliked by no inconsiderable number of persons, is eliminated. The arrangement is open to criticism, however, in that by reason of the decreased leverage obtainable at the steering wheel more effort is required to turn the front wheels, and it might be difficult easily to change the direction of the car with one hand. This applies, of course, only where the current is controlled by means of a hand lever placed beside the driver. Where the current is controlled by means of a lever on top of the steering wheel, or by a pedal, the arrangement has the advantage that it permits the operator to control the direction of the vehicle with both hands, while at the same time current control is at his finger's ends, so to speak, or at his foot.

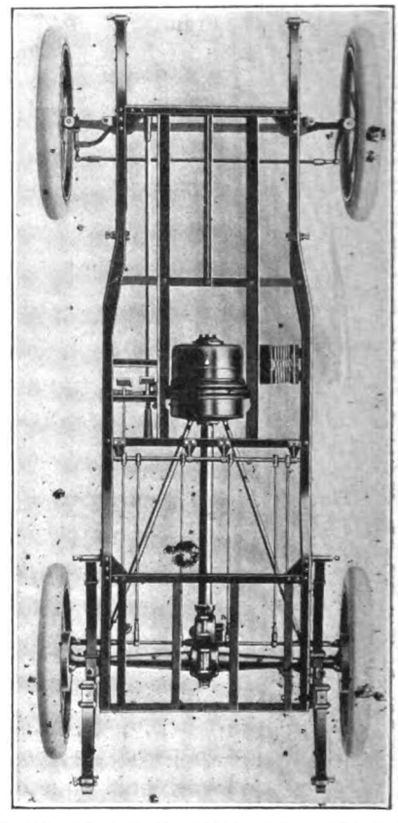
In all the products of the Rauch & Lang Carriage Co., the lever method of steering is adhered to, the arrangement of the lever and the controller handle being shown by the accompanying picture. The controller handle is at the driver's left hand, with the push button which operates the electric signal bell in the top of the handle. As is the case with very nearly every electric, the control is especially simple and requires but the two levers, which are pictured, and two pedals. One pedal operates a pair of powerful brakes located on the rear wheels and the other controls the mechanism whereby the reverse motion is obtained.

In starting the car it is merely necessary that the controller lever be moved forward until the desired speed is obtained. Similarly, stopping the vehicle is just as simple and merely requires that the controller handle be returned to the neutral position and then pulled still further back when the brakes are applied automatically. Immediately the lever is moved backward past the neutral position an electric brake is applied, the connections being so arranged that the motor is converted into a generator. Obviously, its action is strongest at high speed, when the greatest braking effort is required, and gradually it tapers off as the speed slackens until, when the vehicle comes to rest, no braking effort is sustained. If the lever is moved still further back past the neutral position, a set of mechanically operated service brakes on the motor shaft are brought into action. Thus, the control of the car virtually is vested in the steering lever and the control lever, the pedals being auxiliary devices which are used only at long intervals. Owing to the short turning radius of the average electric, it seldom is necessary to use the reverse and the electric brake, and ordinary hand controlled service brakes are sufficient under all ordinary circumstances to bring the car to a stop within the required time.

Classified as to its mechanical construction the controller is what is known as a constant torque device. That is to say, the contact points of the controller are so arranged that, as the contacts which represent the various speeds are made the energy is not interrupted but flows in a continuous stream to the motor. The direct result is that the drive is steady and no jerks are occasioned by momentary cessations of current as the various connections corresponding to speed changes are made. Incidentally, the constant torque eliminates much of the wear on the running gear of the vehicle and results in greater comfort to the passenger.

Controllers of the constant torque type are constructed in several forms, though the flat type, such as is used in the Rauch & Lang cars, and the drum type, which is used in a great many other makes of car, are in the majority. In the flat type, the contacts are arranged in the form of a semi-circle and the contact fingers swing over them. In the drum type, which is manufactured by the Westinghouse Electric & Mfg. Co., and is used in Standard, Hupp-Yeats, Columbus and Century cars, and a number of others equally as well known, the contacts are arranged on a drum with the contact fingers pressing against them.

In the Westinghouse controller, the spaces intervening between segments in the



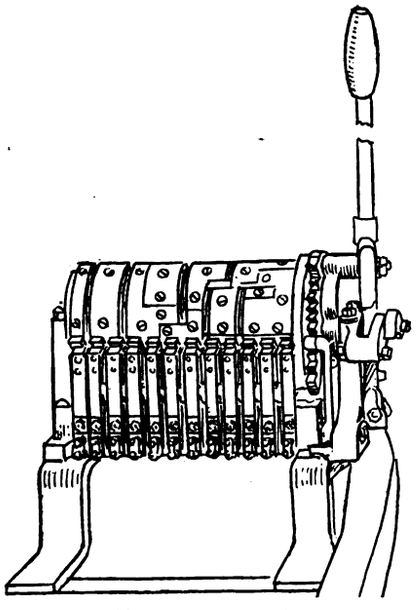
STANDARD MECHANISM ARRANGEMENT

same ring or adjacent rings are filled with fiber, so that the rotation of the drum is not opposed directly by the pressure of the fingers. Therefore, it requires the minimum of effort to rotate the drum, though each notch, corresponding to an increase or decrease in speed, is definitely indicated by the quick action of a ratchet and pawl arrangement. The principal difference between the flat and drum type controllers is that in the former the fingers are caused to move over the contacts and in the latter the fingers remain stationary and the contacts are moved.

The purpose of the controller, of course, is to vary the strength of the current that is passed through the motor, and there are several ways in which this may be done. It is a simple matter to insert resistance in the line and thus decrease the strength of

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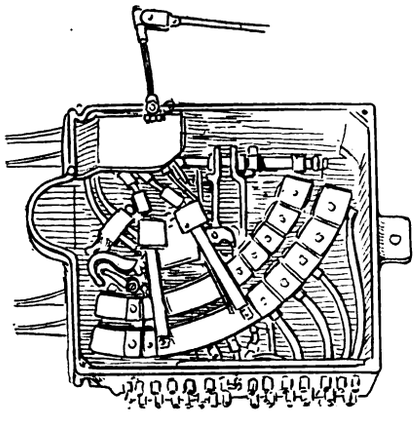
the current, and this is the method that is resorted to in some cases in order to obtain the lowest and next higher speed. For the higher speeds, however, the contacts in the controller are arranged to vary the strength of the magnetic field of the motor and thus to control its speed. In cases where more than one motor is used, it is the general practice to arrange the controller so that the motors are placed in



WESTINGHOUSE DRUM CONTROLLER

series for heavy pulling, such as is required when starting or running through sand or up steep grades, and in parallel for better running conditions where more speed is required.

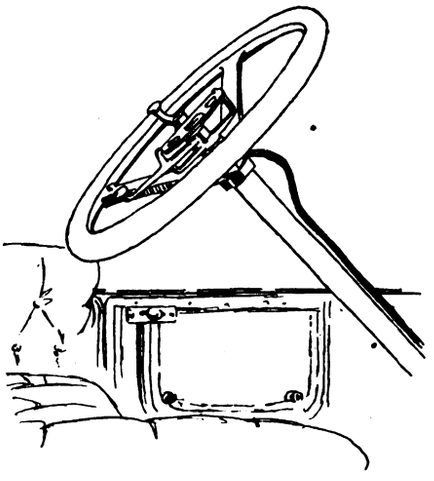
Although the modern controller has been



RAUCH & LANG FLAT CONTROLLER

brought to a high state of perfection where wear practically is eliminated and continuous service over long periods without attention may be expected, its use still requires a certain facility in order to prevent arcing and burning of the contacts. The knack is very easily learned, however, and merely requires that the handle be moved quickly from one position to another. Inasmuch as the continuity of torque is not affected, regardless of whether the handle is moved rapidly or slowly, there really is no excuse for moving it slowly, and trouble from arcing should not and does not result under ordinary conditions, where the driver has been taught how to operate the vehicle properly.

Of course, where the controller is operated by means of a hand lever, the operator virtually handles the whole current of the batteries, and though in no case is this sufficient to cause him injury, and it is doubtful if he would even feel the current in case of a short circuit, it was to remove the cause for apprehension on the part of timid persons and also to provide a control in which arcing and burning of the contacts positively is eliminated that the exclusive arrangement which is used on Ohio cars was adopted. The controller itself is of the constant torque type, and is magnetically operated, the visible portion, shown by the accompanying picture, being

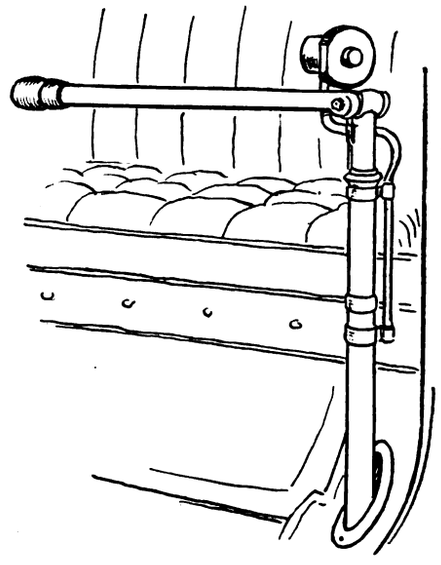


CHURCH-FIELD WHEEL CONTROL

a small circular knob about three inches in diameter located at the top of the steering column. Rotating the knob, according to numerals on its periphery which register with a pointer, five forward and as many reverse speeds are obtainable, the rotation of the knob causing current to flow through magnets, which, in turn, operate the controller which is located in a dust-tight case on the chassis. The electric bell push button is located in the center of the controller disk.

Another of the distinctive features of the control is that immediately the emergency brake is applied, for which purpose a pedal is used, current to the motor automatically is interrupted. Releasing the brake does not turn on the current again, as might be supposed, however. Instead, the car remains inert until the controller disk has been rotated to the neutral position. To obtain the reverse motion it is merely necessary to depress a small button in the controller disk, which then may be rotated backward.

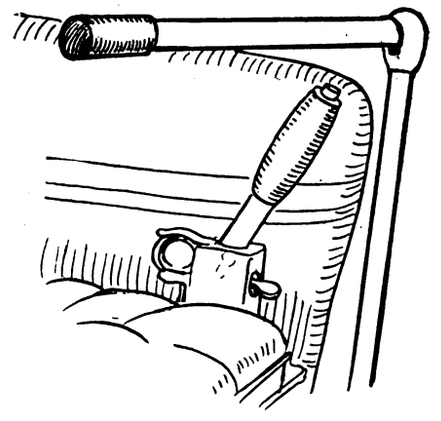
In the Church-Field cars there are incorporated a number of control features which are exclusive and which never before have been attempted in other than gasolene-propelled vehicles. In designing the car, frank admission of an effort to obtain a "gasolenish" effect is admitted, and to this end the wheel steer has been adopted. In order to heighten the effect and also to afford an easy method of control, the operating levers have been placed at the top of the steering column, which position in the gasolene vehicle ordinarily is occupied by the spark and throttle levers. One of these



OHIO MAGNETIC CONTROLLER

levers permits the necessary contacts to be made, in order that the reverse motion may be obtained, and the other controls the current to the motor.

The other control feature which is unusual, and which is a radical departure from anything else of its kind in electric

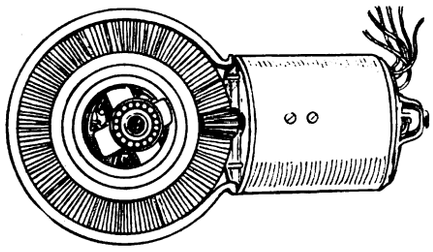


RAUCH & LANG CONTROL LEVERS

vehicles, embraces the incorporation of a two-speed planetary gearset in the transmission mechanism. Inasmuch as it is the general practice to construct the motors of electric vehicles so that they will be capable of sustaining an overload of approximately 500 per cent. for short periods, as when climbing steep grades, or traveling unusually "heavy" roads, the logic of the addition of the change gear mechanism may be appreciated. By using the low gear,

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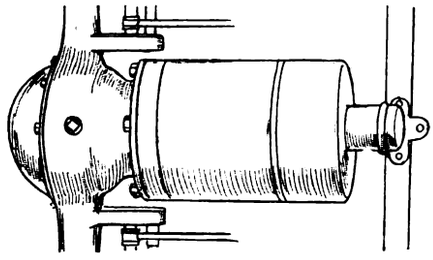
for instance, it is possible to maintain the load on the motor at normal, while at the same time obtaining a tremendous increase in torque at the drive axles due to the relatively high speed of the motor and the low speed of the road wheels. The direct result, of course, is that steeper hills can be climbed on the low gear than it is possible to climb on high gear, while at the same time the current consumption is proportionately decreased, for the motor is not overloaded. Incidentally, maintaining the current consumption at the lowest ebb at all times proportionately increases the radius of action of the car. The planetary



HUPP-YEATS SPUR REDUCTION

gearset is operated by a pedal after the manner that has become fairly common in the lighter gasolene-propelled cars, downward pressure serving to engage low gear and the release of pressure engaging direct drive.

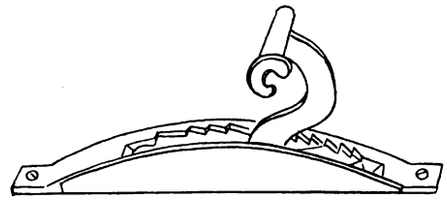
Despite the fact that gasolene-propelled cars invariably are controlled by means of pedals, one for the clutch and the other for the brake, only one manufacturer has applied a similar arrangement to electric vehicles. In the Argo electrics, the controller is operated by means of a pedal,



CENTURY MOTOR SUSPENSION

which serves also to apply the brakes, the arrangement being shown by the accompanying picture. A single pedal, operating in a notched quadrant, is used, its action being similar to the action of the clutch pedal in a gasolene vehicle in that current is turned on in varying strengths, according to the distance the pedal is permitted to follow the withdrawal of the operator's foot, notches being provided to maintain the pedal in any of the intermediate positions corresponding to the various car speeds. Similarly, downward pressure on the pedal has the same effect as is obtained by downward pressure of the clutch pedal of a car in which the clutch and service brakes are interconnected—it applies the brakes. The virtue of the arrangement lies in the fact that the shutting off of current and the applying of the brakes practically is automatic, inasmuch as the approach of danger almost invariably has the effect of causing the driver of a car to brace himself to meet the shock; bracing, in this case, necessitates that the pedal be depressed, which, as has been pointed out, first shuts off the current and then applies the brakes.

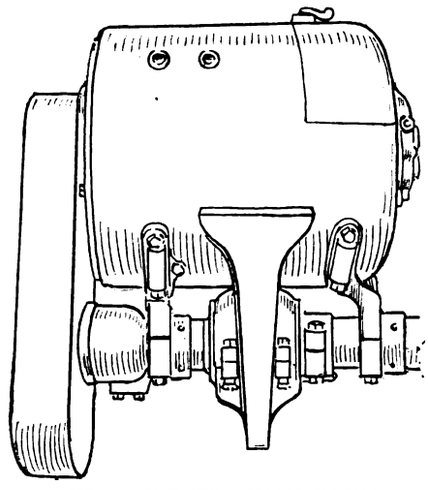
In the disposition of the component parts of the several makes of car on the market—the location of the batteries, the motor, the controller and the motor drive—



ARGO FOOT CONTROLLER

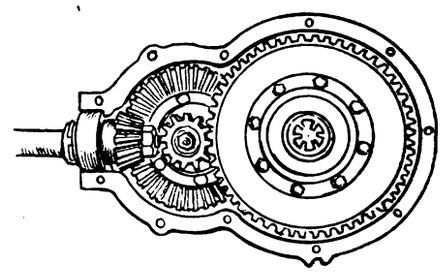
there is not a very great variety, and the matter really is of little moment to the purchaser or intending purchaser, inasmuch as all the arrangements extant fulfill their requirements. It is natural, however, that individual designers should have well-defined reasons for their particular arrangements and that each should eulogize his own.

The question of the location of the batteries, for instance, is a rock upon which designers split. The general practice is to divide the weight on the chassis by lo-



OHIO "SILENT" CHAIN DRIVE

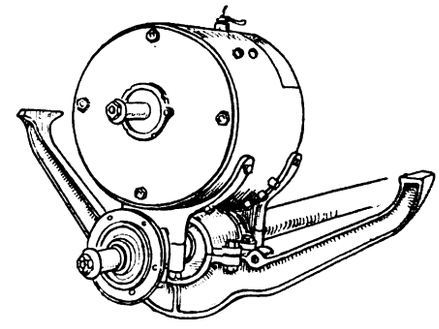
cating half the battery approximately over the rear axle. The arrangement has the advantage that the vehicle is balanced better than it would be with the whole battery in one position or the other, though it is open to a more or less hypothetical objection in that it increases slightly the overall length of the car. In the Baker roadster the whole battery is placed under a hood at the front, and as the passengers' seats are fairly well back and the weight of the motor and drive apparatus also comes more directly over the rear axle, balance is rendered more perfect by this arrangement. But regardless of the actual position of the batteries, it is obvious that their location must be governed to a certain extent by the necessity for accessibility. It is true that they seldom require attention beyond re-charging, but it nevertheless is true that at stated intervals they should be examined thoroughly, for despite the excellence of their manufacture, road vibration is likely to cause minor ailments which, if undetermined and left to develop, may result in more serious complications. As is the case with so many ailments of the human frame, however, such troubles eas-



STANDARD FINAL DRIVE

ily are checked if taken in time, the old saw to the effect that "an ounce of prevention is better than a pound of cure" operating to much the same effect in both cases.

In most cars the motor, which, next to the batteries, is the heaviest portion of the vehicle supported on the chassis, is located "amidships," after the manner illustrated in the Church-Field and Standard chassis pictures, which are reproduced here-



TRUNNION-MOUNTED OHIO MOTOR

with. In the former case, the motor and planetary change speed gear form a unit which is trunnion mounted on a sub-frame in the chassis, the drive being straight through by means of a propeller shaft to the bevel pinions on the rear axle. In the Standard chassis a similar mounting is used, the exception being that the planetary gear is missing, of course. In the picture of the Columbus chassis it may be seen that the motor is mounted at one side. It is but a very little off the center, however, and balance is obtained by placing the controller and radius rod at the opposite side.

In methods of motor drive and final drive considerable variety obtains, though in most cases there is a similarity in that the evolution of the electric car is follow-

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ing in the path of the evolution of the gasolene-propelled vehicle. In other words, the chain drive slowly but surely is passing out of existence. Some few manufacturers equip some of their models with chain drive to the rear wheels, though in the majority of cases shaft drive is preferred for the reason that it reduces the liability to road accidents resulting from broken chains, increases efficiency slightly and eliminates more or less noise.

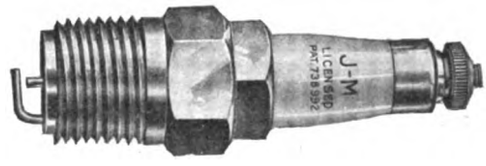
In Ohio and Columbus cars, however, there is a combination of chain and shaft drive, though the chains in these cases are of the "silent" variety and are employed merely to transmit the drive from the motor to the propeller shaft. The method in use on Columbus cars is illustrated in the chassis picture, the motor being placed slightly to one side of the propeller shaft and the chain enclosed in a dust and oil tight casing which ensures its proper lubrication. Though much the same method of motor drive is employed in Ohio cars, the location of the motor and the chain are quite different. The motor is mounted in a cradle which is supported on bearings on the propeller shaft itself. Two views of the mounting are shown herewith, the better to make the arrangement plain, one of them showing the motor and drive shafts with the "silent" chain removed, and the other showing the assembly with the chain and case in position. Final drive is by means of the orthodox bevel gears, one of the peculiarities of the arrangement being that power is conserved by the elimination of all universal joints in the propeller shaft.

The reason for the use of the "silent" chains in both of these cases is to permit of the necessary gear reduction between the propeller shaft and the motor speeds. The factor of motor speed always is incontrovertibly connected with the amount of power developed. That is to say, a small motor operating at comparatively high speed will be more efficient and will generate approximately the same power as a larger motor which operates at lower speed, consumes more current, and consequently is less efficient.

Of course, there are several other ways in which the necessary gear reduction may be obtained. In Argo and Hupp-Yeats and Flanders cars, for instance, the motor is mounted directly on the rear axle, with which it forms a unit, a single housing serving to encase both. In each case the method of final drive is different, however. In the Flanders cars the drive is through an efficient form of worm gearing, in which the worm wheel is made of bronze; in the Argo cars the final drive is through herringbone gears; and in the Hupp-Yeats and Century cars the final drive is through the orthodox pattern bevel gears. In both the latter cases the bevel gear wheel is larger than usually is the case, in order to permit of the necessary gear reduction. In Standard cars, a still different method of final drive is employed, the arrangement being best made plain with the help of the accompanying sketch. The motor is mounted at the forward end of the propeller shaft, its position being shown in the Standard chassis picture, and the drive is through the intermediary of an unusual type of double reduction combination spur and bevel gearing, which is claimed to be more than ordinarily silent and of high efficiency, despite the multiplicity of gears. All electric cars are fitted with differentials, as a matter of course, for the conditions obtaining in the driving mechanism of an electric car are practically the same as those which obtain in the case of a gasolene-propelled vehicle.

Johns-Manville Produces a Spark Plug.

To the already long list of its products the H. W. Johns-Manville Co., of New York, just has added another item of motor equipment—namely, a spark plug which, it is intended, shall be of such merit as to uphold the reputation that has been earned by J-M products in years past. While there is nothing radically new in the construction



or the design of the J-M plug—in fact, it now would be a difficult matter to design a really new spark plug—a number of meritorious features have been combined.

The salient feature of the plug, which is shown by the accompanying illustration, is the insulation, which is built up with a mica core, consisting of at least nine tightly wrapped layers, surrounded by a porcelain jacket of hard-baked glazed material. The outer end of the compound core is protected by a brass cap, which not only protects the porcelain from ordinary mechanical damage, but also prevents the accidental loosening of the binding nut which holds the mica core in place. The inner end of the mica core, from which the central electrode projects, is in a deep cup formed by the projecting porcelain jacket, and this, in turn, is deep in the steel shell of the plug. The central electrode is unusually long and the whole arrangement is such that a very large area must be covered by carbon before a short circuit can be established. Heavy asbestos packing forms a tight joint between the shell and the core, and at the same time permits the necessary expansion and contraction.

Gunpowder to Remove a Broken Pin.

Removing a pin from a hole when the head of the pin has been broken off flush with the top of the hole is not such a difficult matter if the stub can be drilled; but when drilling is impossible there is something of a problem to solve. A contributor to Popular Mechanics found himself confronted by a hardened steel pin broken off short in the end of a transmission shaft, the pin being inserted in the center of the shaft, in its axial line. The problem was solved—and the pin removed—by drilling a small hole in the shaft at a point where it ran into the pin hole just under the end of the pin, filling the space under the pin with gunpowder and then touching off the charge, blowing the stub out without further trouble. The idea is reminiscent of the old-time "bolt-gun" of the railroad running-shed. Things had to be done in a hurry, and in the days of nothing but hand drills for such work, removing a big stub was quite a lengthy process. So if the broken bolt was in a "through" hole, a sort of cannon, loaded with a good charge of powder, was clamped against the hole, the fuse lighted and the obstinate stub blown out the other side, taking threads and all with it. The hole was re-tapped with a larger tap and a new bolt inserted in a third of the time it would have taken to drill out the obstruction with a ratchet drill.

Guarding Carburetter from Foreign Matter.

Even as prevention is better than cure, so it is better to keep water and dirt out of the carburetter than to let it get in and then try to prevent the clogging of the jet Sometimes, however, these pernicious substances, by hook or crook, work their way into the float chamber, and the result is trouble. A plan for keeping foreign matter out of the spray jet, even if it should find its way into the float chamber, is shown in the accompanying illustration from the Autocar. It consists simply in putting a little guard, A, before the outlet to the spray nozzle, so that all the gasolene that goes to the nozzle must pass over the top of the guard. Anything heavier than the fuel will remain at the bottom of the float chamber, and it cannot rise of its own accord and it would take a great deal of it to rise to the level of the top of the guard. A pet-cock, B, is provided to draw off the undesirable stuff at intervals. It is obvious that the top of the guard must be low enough so that it will not interfere with the flow of fuel even when the carburetter is set for the lowest level. Also it is clear that this plan cannot be adopted unless there is a little space between the float and the wall of the float chamber.

Case-Hardening and its Effects.

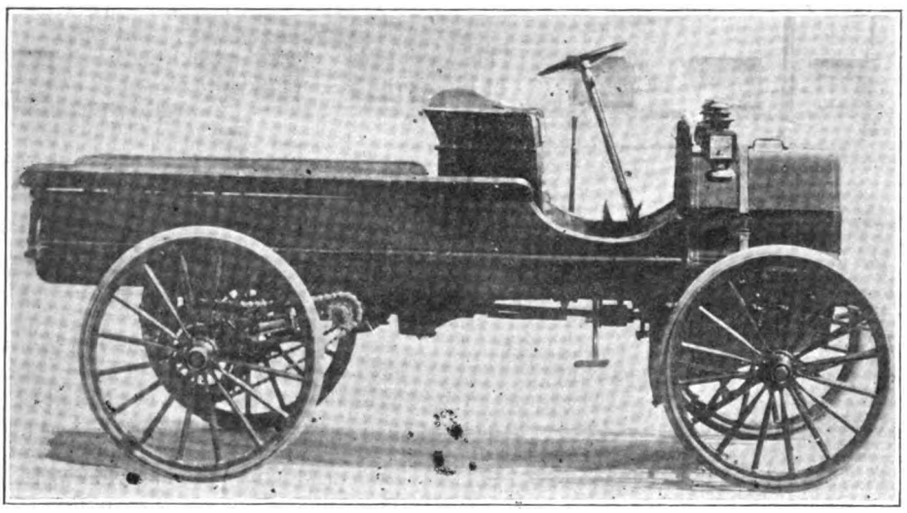
Case-hardening iron consists in actually converting the metal near the surface into steel and then hardening it just as ordinary tool steel is hardened—by quenching it in water or oil. The iron is packed in bone or some other form of carbon and heated, and while in this condition the carbon is absorbed by the metal; the longer the treatment is continued the deeper the carbon enters and the thicker will be the layer of steel. When the "soaking" has been continued long enough to give a "case" of the desired depth, the iron, while hot, is quenched and the steel surface instantly hardens, while the underlying iron remains soft.

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CHASE OFFERS LOW PRICED WAGON

Syracuse Truck Maker Evolves Model Listing at $500—Family Characteristics Retained, Including Fuel Lubrication.

For some time past the mechanical stork has been hovering over the works of the Chase Motor Truck Co., of Syracuse, N. Y., and the alighting of the bird just has been announced. The outcome of the affair is a new machine, designated model M, which is much smaller and much lower in price than any of the older Chase commercial vehicles; the number 500 is employed to designate both carrying capacity and price.



CHASE 500-POUND DELIVERY WAGON WHICH LISTS AT $500

Structurally the new member of the Chase family is similar to its elders, and the familiar outward appearance of the company's product has been preserved. It goes almost without saying that the motor employed is of the two-cycle air-cooled type that has proved to be such a commercial success in the hands of the Chase company, which has consistently advocated the principle of an explosion every revolution and cooling by air since the first Chase wagon rolled out of the shop. Side chain final drive, large wheels with solid rubber tires, comparatively light weight and a general absence of mechanical complication are other features that are retained in the new quarter-ton delivery wagon.

The motor has two vertical cylinders, having a bore and stroke of 4⅛ inches and 4 inches, respectively, and is rated at 12 horsepower. Ignition is by high-tension magneto, with the spark position fixed so that the driver cannot overheat the motor by running continuously with ignition retarded—a thing that drivers of air-cooled motors sometimes insist upon doing, regardless of well-meant instructions. Lubrication is effected by mixing oil with gasolene in fixed proportion, the oil being vaporized with the gasolene and deposited upon the working surfaces. The success of this system, which is in use in all the Chase motors, is due to the fact that the vapor of gasolene and lubricating oil comes into contact with all bearing surfaces; the vapor first enters the crankcase, where it deposits oil upon the crankpin, the wristpin and the main bearings of the crankshaft, and then, passing to the cylinder, the walls are coated with a thin but sufficient film of lubricant that is, and, in fact, must be, fed as regularly as the gasolene itself. In other words, the motor cannot get gasolene without getting oil, and yet it is true that there are absolutely no special lubricating devices on the engine. The change-speed gearing is of the planetary type and provides two forward speeds and the usual reverse; the low speed and reverse are controlled by conveniently located pedals, while a hand lever takes care of the high speed. An oil-tight and, of course, dust-proof casing encloses and protects the gearing.

Wheels are of wood, 36 inches in diameter in the rear and 34 inches in front; the wheelbase is 84 inches and the tread 58 inches. Tires are of solid rubber, 2 inches in diameter. Both axles are of solid steel, of square section, 1⅜ inches in the rear and 1¼ inches in front. Brakes are carried on the rear wheels and are of the duplex type. The front springs are full elliptics, 1½ inches wide, and the rear of the chassis is carried on a cross spring having leaves 1¾ inches wide.

The outside dimensions of the body of the little wagon are 8 feet length by 3 feet 6 inches width, and the inside dimensions—that is, the loading space back of the driver's seat—4 feet 10 inches by 3 feet 4 inches. Weight, 1,500 pounds. The gasolene consumption is given at one gallon to 15 miles running. Three oil lamps and a horn are included in the equipment. The standard body is of the open express type, as shown in the accompanying illustration; panel tops and other types can be built at proportionately greater cost than the standard design.

FROTHED RUBBER FOR TIRE FILLER

Foreign Product Utilizes Nitrogen in Thousands of Tiny Cells—French War Department Testing Its Worth.

There appears to be no limit to the perseverance and resourcefulness of those who seek to produce tire fillings that, while affording a degree of resilience approaching that of compressed air, will be free from the external anxiety to escape that is manifested by closely confined atmosphere. One of the most recent plans, which is of foreign origin, includes the use of a very considerable volume of nitrogen—that gas which constitutes four-fifths of the atmosphere—"put up," however, in such a way that it is divided into an enormous number of tiny globules, each surrounded by a cell of thin but tough rubber. Nitrogen is used because it will not seep through rubber as will oxygen.

In making the new tire filler, rubber is so treated while in a semi-liquid condition that it assumes a frothy consistency, there being a great deal of bubble and comparatively little rubber. While in this state the rubber is vulcanized in iron moulds. Upon being taken from the moulds the filling expands considerably without, however, losing its shape. Placing the rubber froth in the tire necessitates a very considerable reduction in its size and a corresponding increase in pressure. It is said that the amount of rubber in the filling for a tire of a given size is about the same as in an inner tube for the same tire. A puncture in this filling would have no bad effect whatever, because the small number of diminutive cells pierced would bear an almost infinitesimal ratio to the whole number. The French Minister of War is conducting tests with a view to ascertaining the suitability of the new filling for the tires of trucks in army service.

When Mirrors May Become Dangerous.

A mirror placed at the front of the car to enable the driver to see what is approaching from the rear is a good thing and often is extremely useful. There are occasions, however, when such an attachment can be a source of real danger, as was discovered by an English motorist recently. Driving at night, he suddenly was almost blinded by the glare of the lamps from a car approaching from the rear, reflected to his eyes by the mirror. The effect was so sudden and unexpected that he almost ran his car into a ditch. The remedy is, of course, to cover the mirror when driving at night; possibly it may be worth while to use a covering of some thin material, so that lights approaching from the rear could be seen but would not be reflected with sufficient strength to dazzle the driver's eyes and render him temporarily blind.

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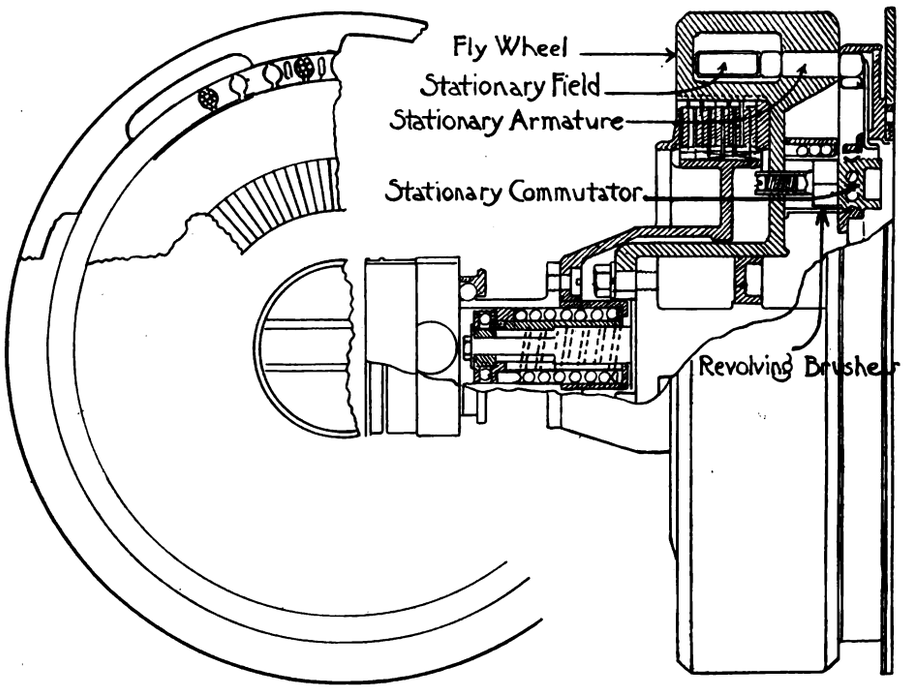
ONE MOVING PART IN OTHO SYSTEM

Starting and Lighting Device from New England Proves Simple and Accessible —Engine Flywheel Alone Moves.

In the design of the successful electric engine starting and car lighting system, it is comparatively easy to perceive that there should be at least two factors paramount in the mind of the designer. The first of these is simplicity, for the average individual knows little and cares less, as a rule, about the fine points of electrical equipment of any kind, and the second is accessibility. A third feature which is less important, though it has a definite bearing on perfection and is much more difficult of attainment than the other two, is that, if possible, there should be no part of the system moving which will require lubrication when the engine is running. Such considerations are vital, of course, and are not hypothetical, and though they are difficult of attainment it is noteworthy that all three of them, and more, are incorporated in the Otho system which just has been perfected and placed on the market by the Otho Motor Co. of 60 State street, Boston, Mass.

Though the system is similar to others of the same nature in that it makes its own current, stores it in an accumulator and then uses it to start the engine and light the lamps, it is radically different from anything else of its kind in its construction and the disposition of its few parts. Briefly, there is but a single moving part, and that part forms the flywheel of the engine. There are no moving wires, no rotating field or armature coils, and there is nothing to require lubrication, for the bearing which supports the flywheel necessarily is oiled automatically from the crankcase of the engine.

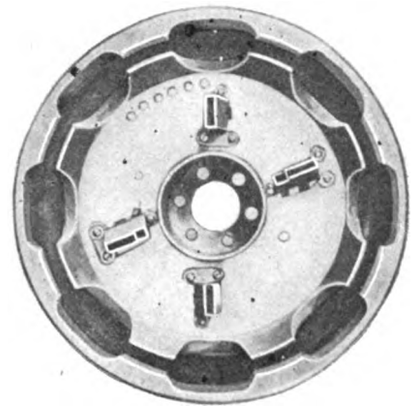
Technically, the system is of the type in which the principal unit is a combined generator and motor, the generator capacity being 40 amperes at 6 volts. Differing from other such devices, however, all the wiring, both that for the field and the armature, remains fixed, only the pole pieces and the brushes rotating. The flywheel itself forms the pole pieces, which are eight in number, and also carries the brushes, the arrangement being shown by the accompanying illustrations, which give two views of the movable portion. All of the wiring is fixed on a "plunger" or central member which is bolted to the engine crankcase and remains stationary between the rotating pole pieces formed in the flywheel. In addition, this central member carries the commutator, which also is shown in one of the accompanying pictures.



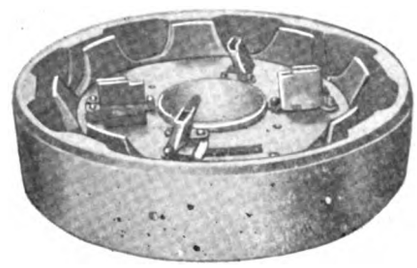
OTHO ROTATING FLYWHEEL AND BRUSHES AND STATIONARY WINDING

By reason of the fact that there is no moving wiring, the possibility of damage to this portion of the system is even more remote than it is in the case of other devices of a similar nature in which the armature and its winding rotates. The effect of centrifugal force on the wiring, of course, is eliminated, and though this seldom is the cause of trouble at present, cases have been known where the wiring has been loosened to such an extent that it touched the pole pieces and resulted in serious damage to the generator by reason of worn insulation and broken wires. Inasmuch as the wiring is at once the most delicate and most expensive portion of any such system, any attempt to render it less liable to accidental injury manifestly is laudable.

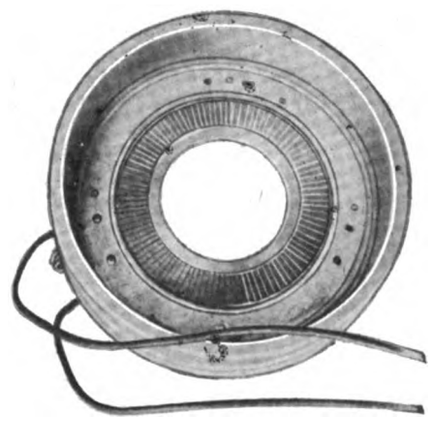
In operation, the system is as simple as it is in construction. A single switch serves to divert current from the storage battery to the motor-generator, the excitation of the field coils causing the flywheel pole pieces to rotate and thereby starting the engine. As a motor the device is strong enough and the capacity of the battery is sufficient to permit of the crankshaft of the engine being rotated at 75 revolutions a minute for a period of 20 minutes, if necessary. Such long applications of current seldom are necessary, however, three or four revolutions of the crankshaft generally being sufficient to cause the engine to take up its own cycle of operation. Nevertheless, because of the speed at which the crankshaft is rotated, it is quite possible to start the engine on the magneto, though it is calculated that a magneto will be an unnecessary adjunct, as current from the



SINGLE ROTATING ELEMENT



POLE PIECES AND BRUSHES



FIELD COIL AND COMMUTATOR

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storage battery may be used for ignition purposes.

Immediately the engine commences to fire, the motor automatically becomes a generator, though it is not connected to the storage battery until the car speed reaches approximately 10 miles an hour, when an automatic centrifugal switch comes into action. Current control is unusual and depends not upon the strength of the current but upon the speed of the engine, there being no magnetic switches in the make-up of the system. The centrifugal switch which "cuts in" the battery when the car speed approximates 10 miles an hour also cuts it out immediately the car speed becomes higher than 35 miles an hour. The charging current from the generator therefore is maintained between the limits which have been ascertained by experiment to give the best all around results.

The simplicity of the whole apparatus is carried even to the wiring which connects the motor-generator unit with the storage battery. For this purpose but two wires are used, and they lead to the battery. A third wire to the chassis for grounding purposes completes this portion of the installation. Despite the comparatively large size of the motor-generator, which might lead to the supposition that it is inordinately heavy, the total weight of the system, exclusive of the storage battery, is but 50 pounds. Inasmuch as a battery generally is carried either for lighting or ignition, the total net weight added by the motor-generator is nominal and practically insignificant.

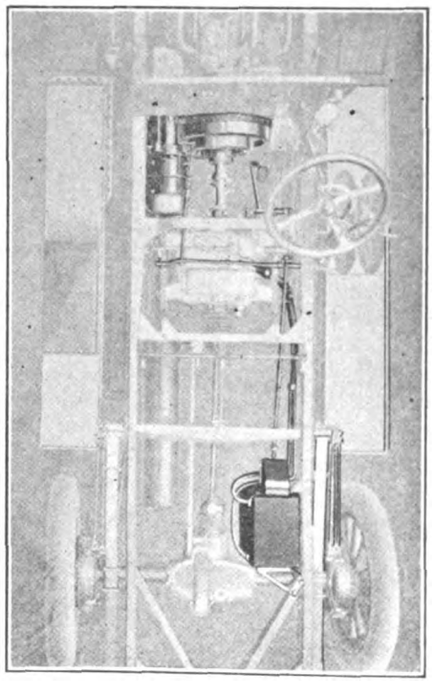
More Electric Lighting Systems Coming.

Indicative of the steadily and rapidly increasing popularity of electric lighting systems, and particularly of the combined electric lighting and engine starting system, two more companies well known to the trade are preparing to supplement their other products with new systems, the one an electric lighting system pure and simple and the other a combined lighting and starting system. The first of these is the Remy Electric Co. of Anderson, Ind., which only last year brought out a combined high tension magneto and lighting generator. The new system will be styled a "dynamo generator lighting outfit" and will be ready for the market in the near future. The other company, the Holtzer-Cabot Electric Co. of Brookline, Mass., also has had extensive experience in the production of electric lighting systems, its automobile system having been on the market for some time and the Holtzer-Cabot railway lighting systems having been in use for a long term of years. Details regarding the combined electric lighting and engine starting system which now is in the course of development are not available, though it is expected that the system itself will be ready for the market before the snow flies, and coming from such experienced and reputable manufacturers they are certain to receive their full measure of attention.

GRAY & DAVIS STARTER APPEARS

Simplicity and Low Voltage Its Chief Characteristics—May Be Used With Any Six-Volt Lighting System.

Although it has been known for some time that the Gray & Davis electric lighting system eventually would be supplemented by an electric engine starting system, it was not until the Peerless Motor Car Co. of Cleveland, O., formally had adopted it for all its newer series cars that it became known that the system actually was ready for the market and its details were made public. Consequently, by reason of the excellent record of the lighting system, speculation has been more or less rife in the trade regarding the ramifications of the new product.



GRAY & DAVIS STARTER CONSTRUCTION

As was to be expected, the starting system is distinguished primarily for the low voltage upon which it operates and for its compactness and simplicity, all of which features have been paramount in the lighting system that has preceded it and in all the other Gray & Davis products. In its simplest aspect, the whole system embraces a compact though powerful electric motor, a 120-ampere-hour storage battery and the necessary operating switches. Though the starting system operates in conjunction with the lighting system, the dynamo of the latter serving to maintain the storage battery in a charged condition, it nevertheless is separate from it and forms an independent unit.

The motor which forms the heart of the starting system is of the four-pole series wound type and is fully enclosed in order to ensure against its more or less delicate windings becoming deranged through the insidious action of dirt or oil or water. The brushes are self-lubricating and are of such exceptionally low resistance that sparking positively is eliminated, even though the motor be subjected to as high as 200 per cent. overload. By reason of the fact that six volts virtually has become standard practice through use by a number of other manufacturers and higher voltages are not looked upon with as great favor by the insurance underwriters, the starting motor has been constructed to operate on this pressure.

The starter is connected to the engine through the intermediary of a double reduction spur gearing, the flywheel carrying on its periphery a gear wheel with which is meshed a small pinion which, in turn, engages a smaller pinion on the end of the armature shaft. The motor itself is supported by means of a bracket on the chassis frame at the left side in proximity to the engine flywheel. Pressure on a small pedal which may be arranged to suit the driver's convenience first permits current to flow to the motor through resistance, thus facilitating the engagement of the starter gears, which is accomplished by further depression of the pedal. Still further depression of the pedal permits the full strength of the battery to flow to the motor, the switch for this purpose being of unusually liberal proportions. It is enclosed within the case which serves to house the battery. Inasmuch as there is but the single voltage to handle, complicated connections are unnecessary and the simplicity of the whole mechanism is proportionately increased, a condition of affairs which has a special appeal to those who have been inclined to consider an electric starter too complicated for ordinary use.

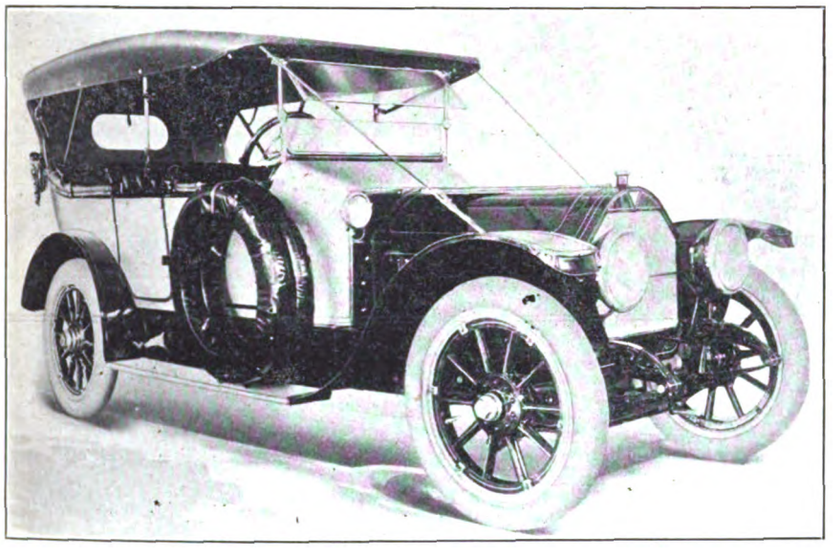
The battery which is used is especially constructed for the purpose by the Willard Storage Battery Co. and is of 120-ampere-hour capacity, the discharge being rated on the basis of 10 amperes continuous output. By way of making plain the capacity of the system to "turn over" even the balkiest motor under the most adverse conditions, such as might obtain during very cold weather with poor quality gasolene, it is pointed out that a six-cylinder Peerless car containing seven passengers has been driven under the power of the starter alone a distance of half a mile, the time required being 16 minutes. Similarly, a 7 per cent. grade was climbed in second speed under starting motor power only, the voltage remaining practically constant for a period of 12 minutes. After these strenuous tests there still remained plenty of reserve "juice" in the battery to start the heavy engine a great number of times. As the accompanying illustration shows, the whole system is as simple as it is possible to make it, wiring having been reduced to the minimum and the operative mechanism being conspicuous for the absence of complication.

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CLEAN DESIGN IN HUDSON "SIX"

Has Unit Power Plant With Electric Lighting, Starting and Ignition System—Other Elements Are Standard.

Building on the strength of fruitful experience gained in the production of four-cylinder cars, the enviable reputation for dependability and consistency that was established by the original "20" having been enhanced and perpetuated by the later "33" and its immediate successor, the "37," the Hudson Motor Car Co., of Detroit, Mich., has signalized its entry into the six-cylinder field with a model styled the "54." As was the case with its predecessors, the designation serves not only to distinguish it from them, but also is indicative of the power of the engine, for though the S. A. E. formula gives it a rating of but 40.8 horsepower, dynamometer tests have demonstrated that at 1,500 revolutions a minute the actual power developed is 54.

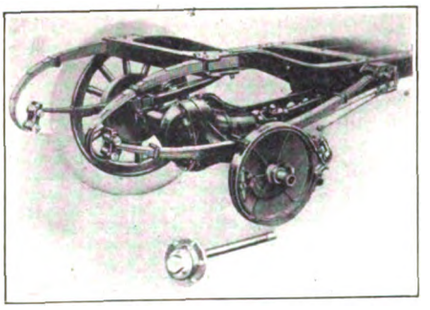


THREE-QUARTER VIEW OF NEW HUDSON "6-54" TOURING CAR

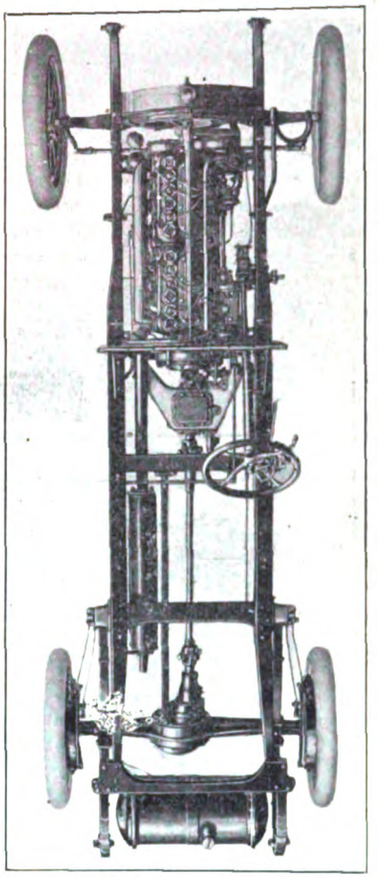
In many respects the new "six," which, like the latest four-cylinder model, is said to represent the united efforts of no less than 48 engineers, each one of whom is a specialist in some branch of automobile engineering, resembles the "37." It is a larger car throughout, of course, as becomes a product of considerably greater power, though it is not cumbersome, an effort having been made to produce a six-cylinder car which should incorporate most of the features which in the past have served to distinguish the four-cylinder Hudsons of the L-head type, with the cylinders cast in sets of three, and the essential elements and equipment of the car differ very little from those that mark the "37."

In price, the car is slightly higher than the "37," as a matter of course, though it still may be classed among the moderate priced vehicles. In roadster and five-passenger touring forms it lists at $2,450; the seven-passenger touring car, the limousine and the coupe list at $2,600, $3,750 and $2,950, respectively, the prices in each case including equipment that is complete, even to the incorporation of a Delco combined ignition, lighting and engine starting system. The remainder of the equipment includes the usual complement of electric head, side, tail and trouble lamps, speedometer-clock, mohair top with dust cover and side curtains, magnetic gasolene gauge, demountable rims with extra rim and tire holders, rain vision windshield and license carriers.

Like the motor in the "37," the new "six" is of the long stroke type, the cylinder dimensions being the same as those of the new four-cylinder engine—namely, 4⅛ x 5¼ inches. In developing the design the manufacturers have been at great pains to ensure quietness of action, though the methods that have been used in attaining this desirable result are in the nature of preventives rather than cures. Thus, for instance, the cause of wear and lost motion has been removed insofar as is possible, and the valve tappets are provided with liberal means of adjustment whereby the "play" between the valves and the push rods can be taken up quickly and easily. The valves themselves are of nickel steel and are interchangeable, the whole valve mechanism being completely enclosed by light removable metal coverings. Another feature which conduces to quietness is that the cams are machined integral with the cam shaft, which is extra large in diameter, in order to obviate the possibility of its deflecting in operation and causing wear in its bearings. These bearings, incidentally, are constructed of nickel babbitt and are unusually liberal in surface.



HUDSON REAR CONSTRUCTION



CLEAN CHASSIS DESIGN

Further reducing the noise of operation, the timing gear train is composed of helical gears which operate in an oil bath.

Lubrication is effected by the constant level splash system, which has been modified to admit of the incorporation of a plunger pump which renders positive the lubrication of the forward and rear bearings, regardless of whether the car is climbing or descending a grade. The main oil supply is carried in a reservoir beneath the crankcase, the oil being maintained in constant circulation through a strainer by means of a gear-driven pump. An oil pressure gauge on the dash serves as a visible indication of the operation of the system. Ignition, of course, is a function of the combined Delco ignition, lighting and engine starting system, which includes a unit generator and electric starting motor, the necessary switches and meters and a storage battery of liberal capacity. After exhaustive tests, in which the idiosyncrasies of the six-cylinder motor with regard to

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carburation were not lost sight of, a specially constructed Zenith carburetter has been adopted. A dash strangler to facilitate starting is part of the equipment, and the fuel is fed from the gasolene tank under pressure generated by means of a plunger pump operated from the cam shaft. Cooling is by water, circulation being maintained with a centrifugal pump.

By way of ensuring positive and efficient clutch action, the multiple disk type has been adopted as being productive of the best all around results. The individual disks are 11 inches in diameter, the driven members being fitted with cork inserts to effect smoothness of operation without slippage. The whole mechanism is completely enclosed in an oil-tight case, which also serves to house the flywheel and is attached to the change gear case. The power plant therefore is a rigid unit which precludes the possibility of the engine and change gear shafts shifting from their proper relationship as the result of frame weaving. Three speeds forward and reverse are provided by the change gear mechanism, third speed being direct drive. The control is selective, by means of the orthodox side hand lever. Power is transmitted to the full-floating rear axles through the intermediary of a nickel-steel, heat treated propeller shaft mounted between two universal joints in which the bearing surface is liberally proportioned. In order to make provision for the absorption of the greater power of the engine it has been found advisable, to remove the strain from the end of the transmission shaft, to add a torsion arm. One end of the arm, which is of pressed steel construction, is mounted on the rear axle, and the other end is supported from the chassis by means of a double-spring buffer.

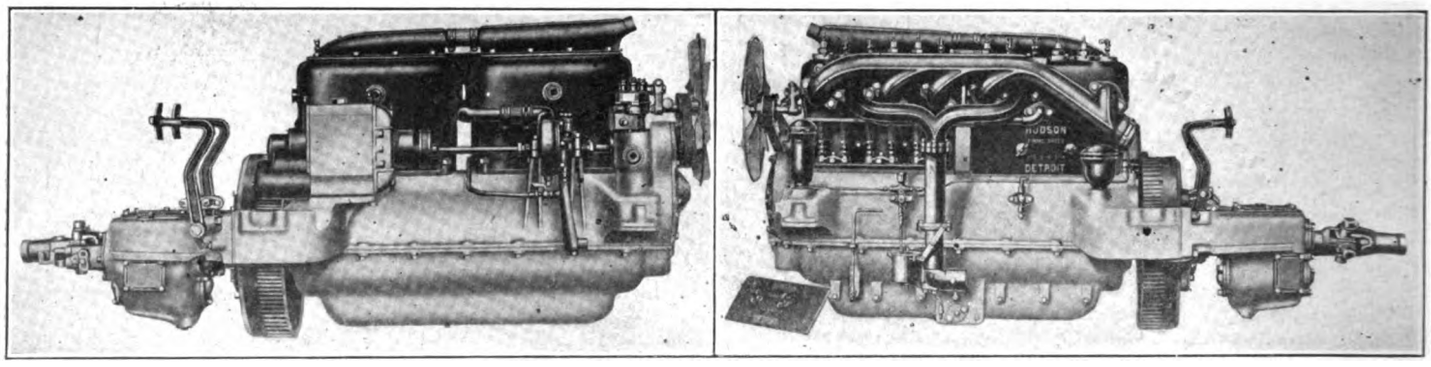
The brakes of the new "six" are substantially the same as those of the "37," both sets being located on 16-inch rear wheel drums. The emergency set, which is hand-operated by means of the usual side lever, is of the internal contracting variety, and the service set is external contracting, both drums being two inches in width. Both sets are lined with special non-burning material and are equalized. With a view to providing easy riding qualities combined with shock absorbing properties of such nature as to render unnnecessary the addition of auxiliary shock absorbing devices, the springs are formed of a comparatively large number of very thin leaves, the front members being of the semi-elliptic variety and the rear members being three-quarters elliptic. The wheels are of the standard artillery type and are shod both front and rear with demountable rims, which are fitted with 36x4½ inch quick-detachable tires. The wheel base is 127 inches and the tread is standard, 56 inches —or special, 60 inches, for Southern touring.

Cole "Six" and "Junior" Make Debut.

Heralding the entry of still another well-known manufacturer into the ranks of the six-cylinder car builders, the Cole "six," which for some time past has been in the mill, so to speak, at last has reached the stage where it is ready for the market, together with the new "four," the Cole Junior, which with the standard four will constitute the 1913 line of the Cole Motor Car Co. of Indianapolis, Ind. The standard four-cylinder model remains practically unchanged, the difference between it and the Junior being in size in proportion to the difference in wheelbase, which is 122 inches for the standard "four" and 116 inches for the "Junior." The price of the "six," the wheelbase of which is 132 inches, has been set at $2,485, which figure includes complete equipment, the car itself being an enlarged edition of the standard four-cylinder model, in which the cardinal features of the latter are incorporated. All three of the models have as regular equipment the Delco electric lighting, engine starting and ignition system, the addition of this and other items of equipment, together with a liberal refinement of detail and a slight change in body lines whereby greater comfort is assured, having made necessary a slight increase in the price of the standard "four," which now lists at $1,985 instead of $1,885. The Cole Junior, being proportionately smaller and lighter than the other two cars, lists at $1,685.

Refinements Only in the Rambler Line.

Barring the accepted features of design which have been laid down and adhered to for the past several seasons, the most conspicuous feature of the newer series of Rambler Cross-Country cars, which are the product of the Thomas B. Jeffery Co., of Kenosha, Wis., lies in the incorporation of the U-S-L combined electric lighting and engine starting system as an item of standard equipment, the apparatus taking the form of a combination motor and generator which replaces the ordinary flywheel, current being stored in an accumulator while the car is running and afterward used to start the engine and light the lamps. As heretofore, the Rambler line, which embraces five different body styles, is built upon a single chassis. In essential elements the chassis has changed but little from its immediate predecessor, the engine being rated at 38 horsepower and having four cylinders and the wheelbase remaining 120 inches. As in the past, the change gear mechanism is of the three-speed selectively operated type, and power is transmitted to the distinctive Rambler rear axle by means of the orthodox propeller shaft. Bodies have been refined in lines by way of providing a more harmonious exterior and the cushions have been increased in depth to 10 inches. In open styles, the five-passenger car and roadster list at $1,700, a special touring car which is distinguished from the other by reason of its capacity for two children in addition to the five adults listing at $1,900. The Sedan, which is designed to carry four passengers and is completely enclosed, lists at $2,500, and the five-passenger limousine sells for $2,750.



TWO VIEWS OF THE NEW SIX-CYLINDER HUDSON UNIT POWER PLANT, SHOWING DYNAMO AND STARTER POSITION

What May Cause Lamp Filaments to Break

It sometimes happens that the filaments of the incandescent lamps used for motor car illumination have a tendency to break in a rather mysterious way after giving only a few days' service. This has been ascribed to the existence of vibration at the time of turning on the current; apparently there is a critical period, just after the lamp has been lighted, when the filament can be considerably weakened by vibration, while after burning for a short time, until the critical period passes, the vibration has no particular effect. Therefore, if filament breakages have occurred for which there is no other explanation, it is a good plan to try lighting the lamps a few minutes before starting the motor.

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TO UNSEAT CONVICTED CHAUFFEURS

New York State Authorities Will Seek the Necessary Power—How They Are Handicapped at Present.

"If the abuses complained of that ex-convicts are running motor cars in New York and other cities of the state are to be stopped," said Deputy Secretary of State Luke J. Keenan, when the subject was broached, "then the Secretary of State must be given the power to revoke any license which he has issued. He does not now possess this power, but I am of the opinion that the Legislature of 1913 will see that that power is conferred upon him. All he can do at present is to reject an application for a renewal.

"A good deal of the trouble comes from owners driving their own cars," continued Mr. Keenan. "We take considerable pains in this office to keep a line on the chauffeurs, and when the driver of a car gets into any legal difficulty the press clipping bureaus supply us with the facts as printed in the papers. These are sent to the New York, Buffalo or Albany office and filed with the application of the chuffeur. If these complaints are serious and a renewal of the license is asked for, it is rejected. This applies, of course, to chauffeurs. Under the law an owner must be granted number license plates, and in this regard I do not see how a law can be framed that would give the Secretary of State any discretion.

"When a chauffeur applies for a license he is required to answer certain questions under oath. He must state whether he has been convicted of a criminal offense and give the particulars. We have no means of knowing whether the questions are answered truthfully. If the application is regular on its face, it is attested by two citizens who swear as to the character of the applicant, and the license is issued.

"There is no doubt the law is evaded in many ways. The most common one is for the chauffeur who thinks his license might be rejected to register as a car owner, and after he has secured the permit to turn the car over to the owner and then run any car."

Threats Come High in Jersey Court.

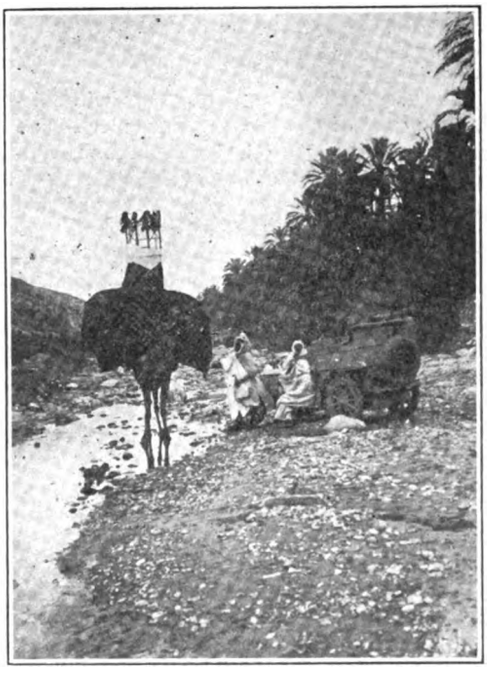
Threatening to "get even" with his employer, Leo Potter, a Paterson (N. J.) garage operator, proved unprofitable last week for Perry Weinberg, when he was found guilty of stealing $20 and was sentenced to not more than three years nor less than eighteen months in state prison, for the angry threat thrown out by the garage employe earned him an additional sentence of 1,000 days. As Weinberg was being led away after the imposition of his sentence he turned to Potter and said, "I'll get even with you."

Judge Martin called him back and said, "I overheard your remark, sir, and now, in addition to your state's prison sentence, I will impose a fine of $1,000 in your case. I want to impress upon your mind the fact that you cannot make open threats in this court."

The fine of $1,000 will keep Weinberg in prison for 1,000 days longer than his original sentence. As he has neither money nor property, it means five years in jail.

Cow-Killing That Paid a Profit.

That an adverse circumstance sometimes may be turned into a profit, was demonstrated in a very effective manner by one Arthur Kimmel of St. Catherine, Ont., who had the misfortune to kill a cow while traversing a highway in his car. Not a cent under $65 would the farmer accept, so



WHEN CAMEL MET THE CAR

Kimmel paid the price and tossed the carcass in the tonneau. Back again in the city, the cow was disposed of to a local butcher at an advance of $20.

Sloan Abandons Two Michigan Meets.

Two race meets which were to have been conducted by J. A. Sloan, at Lansing, Mich., on Saturday, August 3rd, and at Bay City on the following day, were called off by the promoter. Sloan was in a hurry to ship his racing machines to Galveston, Tex., so that the drivers would have plenty of time to "warm up," hence Michigan's possible disappointment.

Lack of Entries Causes Postponement.

At the last moment, the fourth annual endurance run of the Memphis (Tenn.) Automobile Board of Trade, which was to have started on Thursday last, 1st inst., was postponed to start to-day, August 8th. Insufficient entries caused the change.

FISHPOLE TO ASSIST PATHFINDING

How it is Safeguarding Car which is Blazing Route for A. A. A. Tour—Satisfactory Progress Made.

One of the apparently unnecessary things for a pathfinding task is a fishpole, but nevertheless a fishpole forms part of the outfit which is being carried with the Flanders electric coupe which is blazing the 1,100-mile trail for the National Reliability Tour from Detroit to New Orleans, and, far from being unnecessary, it is a valuable safeguard. The Flanders fishpole is capped with a copper hook to which is attached an insulated flexible cable some 15 feet in length, and is carried as "an ounce of precaution" to be used to "tap" the rural trolley circuits when the battery voltage falls below normal at points remote from charging stations.

The car left Detroit on the morning of Wednesday, July 31st, and by evening had covered the 73 miles separating the Automobile City from Adrian, Mich. Ft. Wayne, 102½ miles from Adrian, was reached by Thursday evening, while Friday's progress, 90 miles, carried the car to Munice. Indianapolis, but 32 miles from Munice, was reached on Saturday. Monday's run was the hardest of the week, and the car did not reach Louisville, Ky., 120 miles from Indinanapolis, until late in the evening. Bardstown, 35 miles away, was the stopping point Tuesday evening, while Wednesday night saw the pathfinders at Cave City, after a hard run of 70 miles. In all, 522½ miles were covered in five and one-half days.

Traveling with the electric car which carries only the official pathfinder, W. O. Westgard, and the driver, Charles Ross, are two gasolene propelled cars, the first of which carries F. Ed. Spooner, the official photographer, and his outfit, and the second of which carries the fishpole and other supplies, among which is a number of white flannel suits in which the he-pathfinder and the driver are decked when the car enters town.

Tennessee Fair Pulls Down Barriers.

Although the old prejudice against the automobile has not entirely died out in certain parts of the country, marked indications of such hatred are not supposed to be found in the more populous centers and restricting laws are rapidly disappearing. Tennessee has joined the ranks of those on the "automobile tolerating" list, and the automobile club of Nashville has succeeded in having removed an ancient and obnoxious rule which forbade automobiles to enter the Tennessee State Fair grounds at Nashville during fair time. The lifting of the ban will, it is believed, do much to considerably increase attendance at the fair.

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BOODY STAR AT BOONE RACEMEET

But As It Was Unsanctioned There's Trouble in Store for Him and Several Others—Much-Mixed Program.

Consistent driving of his Ford car brought Harold Boody seven times to the front at the unsanctioned two-day racemeet which was run on the half-mile track at Boone, Ia., on Tuesday and Wednesday, July 30th and 31st, and driving equally as consistent, but a little slower, placed Harrison, the Flanders pilot, in second place in each of the seven. John Erickson (Buick) also made a good showing and took four of the remaining seven events. Erickson won both the five-mile races for two-cylinder cars, a five-mile owners' race and a novelty race, which went for the same distance. Of the remaining three events, two slow races, which went for half a mile, went to Ralph Anderson (Buick) and the third, a five-mile owners' race, to William Pattee (Pope-Hartford). The summary:

Tuesday, July 30th.

One-half mile, slow race—Won by Ralph Anderson (Buick). Time, 10:09⅗.

Ten miles, free-for-all—Won by Boody (Ford); second, Harrison (Flanders). Time, 14:28.

Five miles, for two-cylinder cars—Won by John Erickson (Buick). Time, 6:02.

Ten miles, free-for-all—Won by Boody (Ford); second, Harrison (Flanders). Time, 14:25.

Five miles, novelty—Won by John Erickson (Buick); second, Ross Smith (Overland).

Five miles for owners—Won by John Erickson (Buick); second, J. Mason (Mason). Time, 7:52.

Ten miles, free-for-all—Won by Boody (Ford); second, Harrison (Flanders). Time, 14:35.

Wednesday, July 31st.

Five miles, novelty—Won by John Erickson (Buick); second, Barber (Ford); third, Schroeder (Buick). Time, 9:45.

Ten miles, match—Won by Boody (Ford); second, Harrison (Flanders). Time, 13:56½.

Ten miles, free-for-all—Won by Boody (Ford); second, Harrison (Flanders). Time, 13:44.

One-half mile, slow race—Won by Ralph Anderson (Buick); second, Ed Knight (R-C-H). Time, 9:02.

Five miles for owners—Won by William Pattee (Pope-Hartford); second, H. E. Seymour (Abbott). Time, 7:25.

Fifteen miles, match—Won by Boody (Ford); second, Harrison (Flanders). Time, 20:53.

Fifteen miles, free-for-all—Won by Boody (Ford); second, Harrison (Flanders). Time, 20:50.

All Burman at Altoona's Racemeet.

But one deviation from the usual "Burman-as-usual" program occurred at the Moross racemeet run on Saturday last, 3rd inst., on the Altoona (Pa.) Driving Park track. This occurred in the second event, a two mile free-for-all for the Remy Brassard and trophy, when the White pilot, William Kyle, went through the fence on one of the turns. Kyle escaped with a scratch on the lip, but the machine, which turned three complete somersaults before finally coming to rest, was put out of the running for some time to come. The event was re-run with but two starters, Burman (Mercedes) and Grenon (Cutting), and was completed with the former in the lead in 2:45. A second and final heat was finished in the same order in 2:49. A three-mile Class E event Burman completed in 3:56, and a single mile free-for-all in 1:09. The program was completed when Burman covered a single mile driving the Blitzen Benz in 1:07. The summary:

Three miles, Class E, for cars with displacements of 600 inches and under—Won by Robert Burman (Cutting); second, William Kyle (White). Time, 3:56.

Two miles, for the Remy Brassard and trophy; first heat—Won by Robert Burman (Mercedes); second, Grenon (Cutting). Time, 2:45. Second heat—Won by Robert Burman (Mercedes); second, Grenon (Cutting). Time, 2:49.

One mile, time trial—Robert Burman (Benz). Time, 1:07.

One mile, free-for-all—Won by Robert Burman (Mercedes); second, Grenon (Cutting). Time, 1:09.

Joe Dawson is Denied Reinstatement.

Joe Dawson, the National star, and his manager, C. D. Shuart, who automatically suspended themselves by participating in an unsanctioned racemeet at Memphis, Tenn., on July 4th last, have been denied reinstatement by the A. A. A. contest board. Both men will remain suspended until they produce satisfactory evidence that their lapse was excusable.

Dallas Sees a Speedway Coming.

The Dallas Motor Speedway Co. is in progress of organization in the Texas city of that name. An option has been secured on a tract of land at Oak Cliff, near Dallas, which is sufficiently large to permit of the construction of a two-mile speedway. The company, of which Edward A. Vaughn is acting as secretary, will be capitalized at $250,000.

Matson Restored to Good Standing.

Joseph M. Matson, who was suspended by the A. A. A. contest board for failure to start in an event at Toledo, O., on July 4th last, in which he was formally entered, has been reinstated by the A. A. A. As he had been barred from competition in two subsequent meets, at Wilkesbarre and Scranton, the board considered that he had been sufficiently punished.

DISBROW'S BIG DAY AT KALAMAZOO

Plays the Part of Headliner in Five of the Seven Events—Nikrent and Endicott also Figure.

Not quite all of the honors of the racemeet at Kalamazoo, Mich., on Wednesday last, July 31st, conducted by J. A. Sloan, fell to Louis Disbrow, as William Endicott (Schacht) and Joe Nikrent (Case) each captured a five-mile event in 5:06 and 5:10⅕, respectively. Endicott's victory was in a Class C event for cars with displacements of 231-300 inches, while Nikrent took the free-for-all handicap, driving against three other starters. Disbrow, who piloted in turn a Simplex and a Case car, took the remaining five events which made up the program. The summary:

One mile, time trials—Louis Disbrow (Case), time 1:02½; William Endicott (Schacht), time 0:57⅖; Joe Nikrent (Case), time, 0:59; Louis Disbrow (Simplex), time 0:53⅗.

Five miles, for cars with displacements of 231-300 inches—Won by William Endicott (Schacht); second, Joe Nikrent (Case); third, Louis Disbrow (Case). Time, 5:06.

Five miles, time trial—Louis Disbrow (Simplex). Time, 4:20⅗.

Six miles, Australian pursuit—Won by Louis Disbrow (Simplex). Time, 5:20.

One mile, time trial—Louis Disbrow (Jay-Eye-See). Time, 0:54⅗.

Three miles, for cars with displacements of 231-300 inches—Won by Louis Disbrow (Case); second, Joe Nikrent (Case); third, William Endicott (Schacht). Time, 3:12.

Five miles, free-for-all handicap—Won by Joe Nikrent (Case); second, William Endicott (Schacht); third, Ulbricht (Winkler Special); fourth, Louis Disbrow (Simplex). Time, 5:10⅕.

Promoter Punished for Unsafe Track.

For the first time, a race promoter has been disciplined by the A. A. A. contest board for failure to comply with the requirements designed to make track racing safer. He is Hugh B. Andrews, of Scranton, Pa., who promoted a racemeet at Wilkes-Barre, Pa., on July 20th. He has been declared ineligible for further sanctions until January 1st next. He failed to obey the rule which requires the laying of the dust by the use of oil or calcium chloride, and the removal of the top rail of fences.

A. A. A. Disciplines Another Maker.

For advertising performances of the Schacht car, which finished fifth in the 500-mile race on the Indianapolis Speedway on May 30th last, as the performance of a stock car, the Schacht Motor Car Co., of Cincinnati, O., has been suspended until January 1st next by the A. A. A. contest board.

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1,013,808. Pneumatic Springs for Vehicles. Charles R. Palmer, Cincinnati, Ohio. Filed Dec. 16, 1910. Serial No. 597,673.

In combination with a vehicle body and its supporting frame, pneumatic springs located between the body and the frame, pressure tanks communicating with said springs, and valves for varying the number of tanks communicating with said springs.

1,013,878. Safety Cranking Device. Roland C. Hilton, Quincy, Mass., assignor to Hilton Manufacturing Company, Boston, Mass., a Corporation of Massachusetts. Filed Jan. 10, 1910. Serial No. 537,130.

In a safety cranking device, the combination with a shaft, of a crank arm thereon for giving turning movement thereto, a locking member situated within the crank arm, a handle connected to said arm for turning movement relative thereto, a finger associated with the handle and provided with a cam surface at its end to engage the end of the locking member, turning movement of the handle operating to carry the finger into line with the locking member and thereby force the latter into locking engagement with the shaft.

1,013,895. Mask for Automobile Lamps. Harold D. Penney, Pelham, and Chester A. Weed, New York, N. Y. Filed July 9, 1909. Serial No. 506,788.

The combination with a lamp of the class described, of a mask supported substantially in a perpendicular position relatively to and exteriorly and in front of and spaced from such lamp and constructed to permit the passage of light therethrough and having normally stationary, downwardly projecting means for preventing the escape of the upwardly projecting rays of light and thereby the glare of the lamp, and means for supporting the mask in such position and unconnected with the front of the lamp.

1,013,946. Spring Wheel. William B. McPike, Bowling Green, Mo. Filed June 16, 1910. Serial No. 567,327.

A spring wheel including a rim, a hub, resilient spokes consisting of springs arranged in pairs and connected with the hub and with the rim at spaced points around the latter, and radially arranged spring rods also connected with the hub and the rim and slidable between the outer ends of the springs of each pair.

1,013,949. Spring Felly Automobile Wheel. Thomas F. O'Brien, Highmore, S. D. Filed Dec. 22, 1910. Serial No. 598,870

In a wheel of the class described and provided with outer and inner spaced rims having threaded openings, outer and inner boxing burs respectively provided with threaded portions engaging the said openings of the rims, the said boxing burs being provided with radial alining openings, a tire, felly sections engaging the tire and provided with radial movable stems operating in the openings of the boxing burs, the said stems being each provided with a stop, and coil springs on the said stems and bearing between said stops and the inner boxing burs, the diameter of the stops and springs being less than that of the threaded openings of the inner rim, so that said springs and stems may be removed through said openings, after the said inner burs have been detached from the inner rim, the said felly sections being detachably connected to the outer ends of the said stems.

1,013,955. Carburetter. Robert M. Roberts, Anderson, Ind. Filed Aug. 29, 1910. Serial No. 579,525.

The combination of a crank, a crank case, a cylinder opening into said case, means for supplying air to the case, a piston connected with said crank and mounted in said cylinder, a conduit connected at one end to the crank case and at the other to the cylinder, said conduit having a U-shaped bend at its lowest portion and an oil reservoir below said conduit having a discharge opening into the bottom of said U-shaped bend, a flange extending upwardly within the conduit around said opening to form a reservoir therein for gasolene which is drawn by suction caused by the outward stroke of the piston and which is blown into the cylinder through said conduit on the compression stroke of the piston.

1,013,983. Carburetter. Pehr Martin Blom, Abo, Russia, assignor, by direct and mesne assignments, of two-thirds to Jacob Bruun and one-third to Frank Sparks, Toledo, Ohio. Filed Apr. 10, 1909. Serial No. 489,225.

1. In a carburetter, a carburetting chamber, and outlet chamber, a plurality of walls surrounding the carburetting chamber in spaced relation thereto and to each other, the spaces between the walls being in communication with each other and with the carburetting and outlet chambers, and passages through the carburetting chamber for the exhaust from an engine.

1,013,994. Wheel. Levin Gessford Handy, Rutherford, N. J., assignor to William C. Dickerman, New York, N. Y. Filed June 4, 1910. Serial No. 565,063.

In a wheel, a wheel body, a rim surrounding the same, guide plates at each side of the wheel body having their outer portions fixed to the rim, a plate spring disposed edgewise to the wheel body and inclosed between the guide plates, and frictional means of engagement between the guide plates and said spring.

1,013,995. Wheel. Levin Gessford Handy, Rutherford, N. J., assignor to William C. Dickerman, New York, N. Y. Filed June 4, 1910. Serial No. 565,064.

In a wheel, a wheel body, a rim therefor, and a spring annulus surrounding the wheel body and engaging the same and comprising spaced plate spring sections disposed endwise with respect to each other and edgewise with respect to the wheel body and rim, and connectors rigidly connecting adjacent ends of the sections, and means of engagement between the annulus and the rim.

1,013,996. Wheel. Levin Gessford Handy, Rutherford, N. J., assignor to William C. Dickerman, New York, N. Y. Filed June 4, 1910. Serial No. 565,065.

In a wheel, a wheel body, a rim therefor, a pair of oppositely facing rigidly connected cones having a journaled engagement with the wheel body intermediate their faces, and means of resilient and frictional engagement for the cones on opposite sides thereof with the rim.

1,013,997. Wheel. Levin Gessford Handy, Rutherford, N. J., assignor to William C. Dickerman, New York, N. Y. Filed June 4, 1910. Serial No. 565,066.

In a wheel, a wheel body, a rim therefor, a circumferentially disposed ring between the ring and wheel body, means of resilient engagement between the ring and rim adapted to allow lateral movement of the ring, a plate rigidly fixed to and extending from the ring, and guiding means carried by the rim and engaging the plate for directing movement of the ring.

1,013,998. Wheel. Levin Gessford Handy, Rutherford, N. J., assignor to William C. Dickerman, New York, N. Y. Filed June 4, 1910. Serial No. 565,067.

In a wheel, a wheel body, a rim therefor, a circumferentially disposed ring engaging the wheel body and comprising spaced annuli fixed together, cups fixed to the inner faces of the respective annuli, and each opening toward the opposite annulus, each annulus being formed with an aperture for each of the cups of the other annulus exposing such cups through the respective openings, and friction means engaging the exposed faces of the cups through said apertures, said friction means being carried by the rim.

1,014,036. Gearing for Motor Vehicles. Stephen S. Bennett, Chicago, Ill. Filed June 23, 1909. Serial No. 503,809.

The combination with a shaft, of different sized gears thereon provided with clutch-faces, clutches movable on said shaft into and out of engagement with said clutch faces, a yoke-shaft journaled near each of the clutches, a yoke on one end and a rod on the other end of each of the yoke-shafts, a suitably fulcrumed operating-lever, a pair of shafts transversely journaled with respect to the rods on the yoke-shafts and connected together, one of said shafts having rotary and longitudinal movement and the other of said shafts having rotary movement, means on said shafts to alternately engage the rods on the yoke-shafts, means uniting the operating-lever and said shafts whereby both of them may be rocked and one of them moved longitudinally.

1,014,102. Power Transmission Device. Leroy Vorhies, Yoder, Colo. Filed Apr. 1, 1911. Serial No. 618,421.

In combination, a revoluble friction wheel having a concave face, an oscillatory frame, a friction wheel carried thereby to engage the concave face, a rear driving axle, a shaft having connections therewith, a telescopical connection between the shaft and the oscillatory frame, said means including means for holding the frame adjusted.

1,014,135. Shock Absorbing Hub. Allen R. Fellows, Sioux Falls, S. D. Filed Feb. 17, 1910. Serial No. 544,467.

A shock-absorbing hub, comprising an outer hub and an inner casing, the hub being provided with annular grooves and the casing with disks operative within said grooves, a plurality of radial arms integral with and projecting from the casing, sockets arranged in the inner wall of the hub, in which the arms are adapted to freely move, and springs encircling said arms, whereby the casing and the hub are sustained in concentric relation.

1,014,145. Lock for Motor Vehicles. David P. Graham, Detroit, Mich., assignor of one-half to Levi C. Hayden, Tecumseh, Mich. Filed Jan. 9, 1911. Serial No. 601,584.

A device for the purpose described comprising a lock having a stationary barrel and a rotatable bolt in said barrel having an end extending beyond the barrel and formed with a plurality of faces, a spring secured to the barrel in engagement with one of said faces to yieldingly hold the bolt from turning, a tubular casing inclosing the barrel and spring, and a shaft pivotally at-

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tached to the extended end of the bolt at one end.

1,014,177. Vehicle Wheel Hub. George T. Reichenbach, New Castle, Del., assignor to H. O. Peck Automobile Wheel Company, Incorporated, Portland, Ore. Filed Feb. 25, 1911. Serial No. 610,798.

A vehicle wheel hub that includes a shaft engaging sleeve, a disk secured to said sleeve, a second disk mounted on said sleeve and spaced from said first-mentioned disk, one of said disks having a set of pin receiving apertures, pins secured in said apertures, the other disk having pin receiving recesses into which said pins project, spoke heads mounted on said pins between said disks and a cap secured on said sleeve to hold said second mentioned disk in engagement with said pins, together with an annular thin metal partition held between said disks, and engaging said spoke heads.

1,014,188. Carburetter. Wilson Ross Voorhees, Perth Amboy, N. J. Filed Dec. 27, 1910. Serial No. 599,581.

In a carburetter, a chamber having means for the introduction of fuel thereinto, said chamber having its walls receding from a point adjacent to the point of entrance of the fuel, means for adjusting the degree of inclination of the walls with relation to the fuel inlet, and means other than the first-named means for also adjusting the degree of inclination of the walls with relation to the fuel inlet.

1,014,209. Front Wheeled Truck for Vehicles. Samuel K. Dennis, Chicago, Ill., assignor to International Harvester Company, a Corporation of New Jersey. Filed Oct. 20, 1911. Serial No. 655,712.

A fore truck for manure spreaders including, in combination, a receptacle having longitudinally arranged base sill members upon opposite sides thereof, vertically arranged bars having their lower ends secured to the front ends of said base sill members, a transverse bar having opposite ends thereof secured to the upper ends of said vertical bars, a truck bolster member having its rear end secured to the central portion of said transverse bar and curving forward and downward and terminating in a leg portion having the lower end thereof pivotally connected with a truck axle, a U-shaped truck frame member having its central portion secured to said bolster member and the side members thereof extending outward, downward and rearward and secured to said vertical bars and said base sill members.

1,014,244. Cushion Wheel for Vehicles. John F. Mitchell, Topeka, Kans. Filed July 9, 1906. Serial No. 325,331.

In a vehicle wheel, the combination with a hub, of a rim surrounding the hub, endless cam tracks secured to the rim, and springs connected at their inner ends to the hub and extending at their outer ends within and movably engaging said endless cams, whereby said springs are flexed longitudinally by a relative movement of the hub and rim.

1,014,270. Explosion Engine. John G. Utz, Detroit, Mich., assignor to Chalmers-Detroit Motor Company, Detroit, Mich., a Corporation of Michigan. Filed Apr. 9, 1909. Serial No. 489,012.

In an explosion engine, the combination with means for introducing an explosive charge into the explosion chamber, and means for introducing a variable volume of compressed air to augment said explosive charge; of means automatically operating, upon the variation of the volume of said augmenting air, for proportionately varying the richness of the explosive mixture.

1,014,318. Cushion Tire. Myron C. Merriman, Detroit, Mich. Filed May 18, 1911. Serial No. 628,076.

The combination with a wheel the rim whereof is provided with side plates one of which is removable, of an endless cushion tire consisting of a resilient arch having inwardly projecting base portions integral with the feet of the arch and abutting to form a chord to the arch, and two rigid endless bands, one forming a part of each base portion whereby the chord maintains the feet of the arch firmly upon the rim and against the said side plates thereby giving full force and effect to the cushioning function of the arch regardless of the thrust of the wheel and without any possibility of displacement of the tire.

1,014,319. Carburetter Attachment. Harry A. Miller, Los Angeles, Cal. Filed Apr. 18, 1910. Serial No. 556,253.

A varburetter provided with an air inlet valve and frictional means for restraining only the opening movement of the valve.

1.014,357. Anti-Skidding Tire. George J. Adam, Chicago, Ill. Filed Oct. 18, 1909. Serial No. 523,309.

An anti-skidding tread device for tires comprising, in combination with a tire having an outer tread surface provided with open channels running across the tread and extending about the sides of the tire. anti-skidding pads of tough, non-metallic, flexible material confined in said channels, the thickness of said pads being greater than the depth of said channels and said pads and channels being laterally extended at their ends.

1,014,358. Anti-Skidding Device for Tires. George J. Adam, Chicago, Ill. Filed Apr. 25, 1910. Serial No. 557,329.

In an anti-skidding device provided with tough, non-metallic, flexible, friction-inducing pads, a retaining plate adapted to underlie the end of a pad, said retaining plate being provided with upturned flanges extending about one end adapted to engage the edges of the pad, and means for attaching the pad to the retaining plate.

1,014,429. Headlight for Automobiles. Otis B. Woodfield, Otto M. Morris, and John W. Gosling, Spring Lake Beach, N. J. Filed July 25, 1910., Serial No. 573,762. Renewed June 6, 1911. Serial No. 631,566.

In a device of the class described, a supporting member, a lamp carrying member mounted thereon, an operating member adapted to be moved by a vehicle running gear, a rotative lamp-turning member cooperating with said lamp-carrying member and the operating member, said rotative lamp-turning member being movable relatively to the operating member so as to be disengaged therefrom, and means for locking the lamp-carrying member from rotative movement when the rotative lamp-turning member is disengaged from the operating member.

1,014,439. Steering Gear for Automobiles. Philip H. Bellmore, Missoula, Mont. Filed Feb. 10, 1910. Serial No. 543,084.

In an automobile, a frame including a rear bolster, a front axle, steering knuckles pivoted to the ends of said front axle and provided with front wheel journals, arms extending longitudinally of the frame from the journals, a tie rod connecting said arms, a casing swiveled to the rear bolster to swing in a horizontal plane, a rear axle carried in the casing, a lever including members extending forwardly from the casing on opposite sides of the pivot thereof, and a connection between the tie rod and the lever for simultaneously swinging the front wheel journals and the rear axle casing.

1,014,464. Reinforced Inner Tube for Pneumatic Tires. Frederick Harold Hall. Norton Lindsey, England. Filed Sept. 9, 1910. Serial No. 581,244.

A reinforced inner tube for pneumatic tires the walls of which are combined with a continuous encircling band of fabric which is plaited circumferentially, said plait of the fabric contained within and filled by a thickened ridge of rubber which conforms to the shape of the plait.

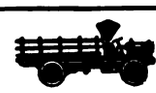
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INDEX TO ADVERTISERS



A

Abbott Motor Co. 55
Adamson Mfg. Co. 72
Ajax-Grieb Rubber Co. 61
American Ball Bearing Co. 68
American Motors Co. 14
American Starter & Carburetor Mfg. Co. 70
Apple Electric Co. 72
Argo Electric Vehicle Co. 56
Atwater Kent Mfg. Works 57
Automobile Supply Mfg. Co. 69
American Locomotive Co. 48f

B

B & L Caster Axle Co. 64
Badger Brass Mfg. Co. 70
Bantam Anti-Friction Co. 67
Barthel, Daly & Miller 62
Bartholomew Co. 68
Benz Auto Import Co. 60
Bosch Magneto Co. 63
Bossert Co. 56
Bretz Co., J. S. 72
Briggs-Detroiter Co. 66
Brown-Lipe-Chapin Gear Co. 67
Bush Mfg. Co. 48g

C

Cartercar Co. 66
Champion Ignition Co. 69
Champion Spark Plug Co. 10
Clarke-Carter Automobile Co. 66
Classified Advertising 52-53
Cole Motor Car Co. 8-9
Colliers 49
Colonial Electric Car Co. 70
Consolidated Mfg. Co. 70
Continental Motor Mfg. Co. 56
Covert Motor Vehicle Co. 71

D

Dayton Auto Truck Co. 70
Dayton Rubber Mfg. Co. 56
Dean Electric Co. 13
Detroit & Cleveland Navigation Co. 72
Diamond Rubber Co. 69
Double-Fabric Tire Co. 67

E

Electric Welding Products Co. 60
Empire Automobile Co. 71
Empire Tire Co. 68

F

Fedders Mfg. Works 67
Federal Miniature Lamp Works 57
Federal Rubber Mfg. Co. 59
F. I. A. T. 70
Fire Proof Garage Co. 56
Firestone Tire & Rubber Co. 3
Ford Motor Co. 63
Franklin Automobile Co. 71
Fulton-McCutchan Co. 48g

G

G. C. A. Mfg. Co. 67
Goodyear Tire & Rubber Co., The 57
Grant-Lees Machine Co. 56
Gray & Davis Front cover
Great Northern Hotel 62
Grossman Co., Emil 56

H

Hartford Suspension Co. 15
Havers Motor Car Co. 66
Haynes Automobile Co. 70
Hodge & Graves 69
Hupp Motor Car Co. 71
Hyatt Roller Bearing Co. 11

I

Ignition Starter Co. 56
Inner Shoe Tire Co. 57
Inter-State Automobile Co. 68
Invincible Starter Co. 67

J

Jeffery-Dewitt Co. 6
Jencick Motor Corp. 68
Jones Speedometer 50

K

Kellom & Co., Chas. F. 57
Kelly-Springfield Tire Co. 56
King Motor Car Co. 68
Kinsey Mfg. Co. 67
Kissel Motor Car Co. 64
Kline Motor Car Corp. 66
Knight-Davidson Co. 64
Knox Automobile Co. 12

L

Lauth-Juergens Motor Car Co. 63
Leather Tire Goods Co. 56
Locomobile Co. 57
Lovell-McConnell Mfg. Co., Inside back cover

M

McCue Co. 16
McGraw Tire & Rubber Co. 56
M & P Electric Vehicle Co. 71
Metz Co. 57
Michelin Tire Co. 54
Michigan Buggy Co. 66
Miller, Chas. E. 58
Moline Auto Co. 62
Mosler & Co., A. R. 48g
Moss Photo Engraving Co. 65
Motor Car Equipment Co. 57
Mott Wheel Works 72
Motz Tire & Rubber Co. 57
Mutty Co., L. J. 57

N

National-Acme Mfg. Co. 57
National Motor Supply Co. 56
National Motor Vehicle Co. 51
New Departure Mfg. Co. 64
New Process Rawhide Co. 69
Niagara Sales Co. 57
Nordyke & Marmon Co. Inside front cover
Nyberg Automobile Works 17, 18, 19, 20

O

Oakland Motor Car Co. 71
Otho Motor Co. 56
Owen & Co., R. M. 57

P

Penn Spring Works 58
Perfection Spring Co. 56
Piel Co., J. 72
Polson Mfg. Co. 21
Premier Motor Car Mfg. Co. 4-5
Prest-O-Lite Co. 56
Pullman Motor Car Co. 64

R

Rajah Auto Supply Co. 67
R. C. H. Corp. 68
Reliance Speedometer Co. 56
Remy Electric Co. 62
Republic Rubber Co. 56
Royal Equipment Co. 48h
Rutenber Motor Co. 66

S

Sanford Motor Truck Co. 60
Schrader's Sons, A., Inc. 65
Shawmut Tire Co. 70
Sheldon Axle Co. 2
Sparks-Withington Co. 48g
Speedwell Motor Car Co. 71
Splitdorf Electrical Co. 69
Springfield Metal Body Co. 57
Standard Roller Bearing Co. 57
Stearns Co., F. B. 66
Studebaker Corporation Back cover

T

Timken Roller Bearing Co. 7
Tobias, F. H. 56
Twitchell Gauge Co. 61

U

United Rim Co. 72
United States Tire Co. 64

V

Valentine Co., J. H. 65
Volkmar Auto Starter Co. 69

W

Warm Hand Steering Wheel Co. 1
Warner Gear Co. 61
Warner Instrument Co. 65
Weed Chain Tire Grip Co. 57
Whitney Mfg. Co. 59
Willard Storage Battery Co. 57
Willys-Overland Co., The 21



Mosler
Spit-Fire
Are The Best
A. R. MOSLER & CO
163 WEST 23rd STREET
NEW YORK, N.Y.

The Ford Water Circulator

forces the water from radiator through cylinder water jacket, maintaining rapid circulation when car is in motion. Write for descriptive matter if you handle Ford cars.

THE FULTON-McCUTCHAN CO.
1146 Michigan Ave. CHICAGO, ILL.

The Bush Radiator
THE BUSH MANUFACTURING CO.
HARTFORD, CONN.

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AVOID ACCIDENTS!

Safety, Satisfaction, Service

Here is the best brake and brake lining. Motor car efficiency depends on brake efficiency—likewise safety and service.



DUPLEX EXTERNAL BRAKES

These brakes make motoring safe. They give security. They possess maximum braking surface. One end of a flexible band is fixed, while the operating force is applied to the other end in the direction of the rotation of drum. DUPLEX works instantly whether car goes forward or backward. It brings the car to a gradual or immediate stop—as desired.



TRADE MARK Raybestos REG. U.S. PAT. OFF.

Made of highest grade of Asbestos woven with copper wire. RAYBESTOS grips and holds. It lines all the best brakes; found on the good cars—enhances the safety and efficiency of every car regardless of make or price. It does not disintegrate upon contact with oil, gasoline, or water. It is the original heat-proof facing and has the highest coefficient of friction. Comes in all widths. Ask your dealer. Name stamped in each foot of fabric.

THE ROYAL EQUIPMENT COMPANY

436 Housatonic Avenue **Bridgeport, Conn.**

We also make Raymond Brakes and Gyrex, the Mixer.

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A Consistent Leader

For the first six months of 1912 Collier's led in the amount of automobile advertising lines published in the general periodical field—

This record was also a gain of 3% over its corresponding period of 1911—

In 1911 Collier's led this field—

It has maintained this leadership in automobile advertising for over seven years—

CONSISTENT SUPREMACY LIKE THIS IS PROOF CONCLUSIVE OF ITS INTRINSIC VALUE.

Collier's

The National Weekly

E. L. Patterson

Manager Advertising Department.

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Read What Capt. Stiles of the Chicago Police Says About—



JONES SPEEDOMETER

WEST CHICAGO PARK COMMISSIONERS
DEPARTMENT OF POLICE

A. J. STILES, Captain

Jones Speedometer, Chicago, Ill. Chicago, June 21, 1912.

Gentlemen: It is with great satisfaction that I have at last found a Speedometer that has proven under all kinds of tests to be almost absolutely perfect. I have tried all other Speedometers and was compelled to discard them, as they would not stand a test for accuracy; or, in other words, were merely a guess. In using the Jones Speedometers in my department, I can conscientiously say that we have found no condition and under no circumstances the Jones Speedometer to be wrong.

Inasmuch as we are making a great many arrests for the violation of the State Vehicle Law, and with a disposition to be fair, I say again that it was a great consolation that we have found a Speedometer that we can depend upon. These Speedometers I test every day under a stop-watch, and with a very few exceptions they are always accurate.

Yours very truly, ARTHUR J. STILES,
Captain West Park Police Department.

Police officers don't guess—guesswork isn't valuable testimony. They take no chances with inaccurate speedometers. They use **the** instrument that's "geared to the truth," that's just as accurate on the hottest as on the coldest day. **The** instrument that is **impervious** to electrical influence. Mr. Motorist, the Police Departments in all the large cities use the JONES SPEEDOMETER. Better get in line. Ask your dealer.



CAPT. STILES AND TEN OF HIS MEN

THE JONES SPEEDOMETER **Factory: New Rochelle, N. Y.**

Chicago Boston Philadelphia San Francisco Buffalo Los Angeles Portland Seattle Detroit

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Why Do Some Dealers Prosper While Others Fail?



This book is Free

This little book will help turn every demonstration into sales for you. It is free, while they last, to any dealer. It gives you selling points, and gives you the benefit of thousands of dealer's selling experiences. Write for a copy at once. Ask for book entitled, "How to sell MORE motor cars."

OUR sales-service department is at your service, to help analyze your selling problems, and help you **turn *failure into success.***

If you are an old dealer, who is not prospering as much as you think your labors justify—write us at once.

If you are just starting in business, you cannot afford to miss this opportunity of having us co-operate with you.

Write, giving name, address, and outline your selling problem. We will help you absolutely free of cost and without a single obligation upon your part.

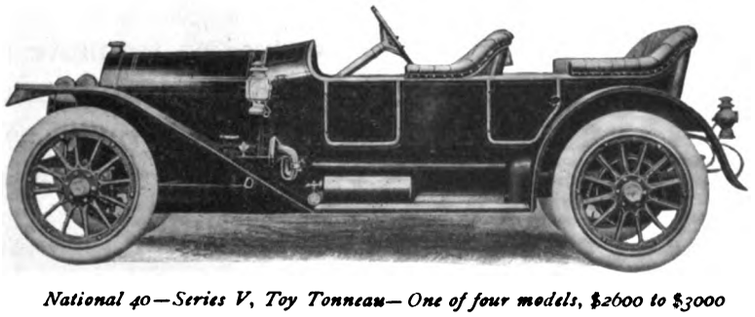
We have helped other dealers to prosper and we can do the same for you.

Remember—people *do not buy* cars any more—*you must sell* them.

More cars than ever before are going to be sold in 1913. Will you be one of the dealers to prosper? *Make prosperity certain by writing us at once.*

National Motor Vehicle Co., Indianapolis, Ind.

Maker of **World's Stock Champion—and—International Champion**



National 40—Series V, Toy Tonneau—One of four models, $2600 to $3000

CUT OFF COUPON AND MAIL AT ONCE

NATIONAL MOTOR VEHICLE CO., Indianapolis, Ind.

Dear Sirs—Please send me your 1913 catalog. I am interested in your dealers' proposition.

Name .....

Address .....

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For Sale—Wants—Exchange

15 cents per line of six words, cash with order. — In capitals, 25 cents per line —

A market place where Dealers, Jobbers and Manufacturers may buy, sell or trade used cars, parts and appliances and where help or situations may be secured at a nominal cost.

THE STEVENS-DURYEA COMPANY HAS ERECTED AND EQUIPPED A MODERN AND UP-TO-DATE FACTORY FOR MANUFACTURING THEIR OWN BODIES AND IS NOW READY TO RECEIVE APPLICATIONS FROM FIRST-CLASS WORKMEN IN THE SEVERAL BRANCHES OF BODY BUILDING: BODY MAKERS, SHEET METAL WORKERS, PAINTERS, UPHOLSTERERS, ASSEMBLERS, ETC. ADDRESS: SUPERINTENDENT, STEVENS-DURYEA COMPANY, EAST SPRINGFIELD WORKS, SPRINGFIELD, MASS.

LIST FORD OWNERS for U. S. and other makes of cars. Complete lists, 5,000 names, $2.50. OWNERS AUTO LIST COMPANY, Albany, N. Y.

WANTED—First-class machine shop, equipped with modern machine tools, wants special machinery to manufacture. Also prepared to handle Model and Experimental work. THE DARIEN MACHINE COMPANY, Darien and Noble Sts., Philadelphia, Pa.

FOR SALE—One 1912 Pierce-Arrow, 48 H.P., seven passenger, Brewster green, run less than 500 miles. C. E. KEMP, 306 Locust St., Williamsport, Pa.

CAPITAL wishes to connect with a competent party for building moderate priced motor trucks. Address, EIGHO, care The Motor World, New York City.

FOR SALE CHEAP—1912 Majestic side car; used only one day. Same as new. To first buyer at $40. Write to M. H. REHRIG, Chambersburg, Pa.

FOR SALE — Locomobile, 1911 model; horsepower, 30.6; maker, Locomobile Co. In good order. Not been used this year. Cost $5,000.00. Highest offer gets it. In perfect running order. Address M. W. ADAMS, Chatham, N. J., where car can be seen,

FOR SALE—Fully equipped plant for the manufacture of vehicles and automobile bodies, located at 28 to 32 Bank street, Trenton, New Jersey, and occupied by the FitzGibbon & Crisp Carriage and Wagon Co. Buildings consisting of four-story main factory, three-story trimming and store house, blacksmith shop, lumber sheds, etc. A live going proposition doing a large business in vehicles and automobile bodies, to be sold at Receiver's Sale on August 23rd, 1912, at 2 P. M., on the premises. JAMES C. TATTERSALL, Receiver.

FOR SALE—Columbia electric landaulet; recently overhauled and in good condition. Complete with Edison Charging Board. Price reasonable. Inquire P. MALI, 73 Fifth Ave., New York City.

EXECUTIVE ENGINEER AND SALESMAN desires position in either service or selling departments. Ability proven; go anywhere, either factory or branch. BOX 206, Motor World.

AUTOMOBILE Cylinders Reground, new pistons and rings fitted. Garage air compressors. CAST IRON BRAZING CO., Manchester, N. H.

FOR SALE—Touring car, 5-passenger, in excellent condition; price reasonable. Address P. O. Box 367, Springfield, Mass.

WANTED—5 pass. car, 1911 or 1912 model; will trade 20 acres fruit land, Palm Beach Co., Florida. Address, BEN. H. HARMS, Platteville, Wis.

FOR SALE—Dealer in new and second-hand automobiles; Ford runabout, 4 cyl., 26 H. P., top, windshield, rumble seat. Maxwell runabout. Oldsmobile, 4 cyl., top, 5-passenger, and windshield. Rambler, 2 cyl., top, 5-passenger, and delivery body, all in good condition. F. B. ARDRIE, 21 Carnes St., W. Lynn, Mass. P. S.—Wanted—to buy 50 automobiles.

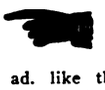
FOR SALE—6 cylinder Franklin engine, complete with magneto, carburetter, fine condition, $175.00. BOX 210, care Motor World.

FORD OWNERS, improve the appearance of your Fore Door Touring Car or Torpedo Runabout 50% for $3.25. Send postal for information. LINDELL AUTO SALES CO., 3444 Lindell Ave., St. Louis, Mo.

AUTOMOBILE Troubles and How to Remedy Them. Cloth $1.00; flexible leather $1.50. Automobile Driving Self Taught. Cloth $1.00; flexible leather $1.50. Guarantee with every book. Send for circular showing other Practical and Mechanical books. AUTO INFORMATION BUREAU, Box 704, North Tonawanda, N. Y.

BAKER ELECTRIC STANHOPE, just overhauled and painted, $390; will demonstrate. Victoria, $720; Newport Phaeton, $350. Telephone, Columbus 2830. BAKER VEHICLE COMPANY, 1798 Broadway, N. Y. City.

WE BOUGHT AT BARGAIN from bankrupt factory 500 fine mohair tops, $40.00 kind; will sell at $10.00 each cash, complete with curtains, covers and windshields. This price will move quick, so get your order in early. PURITAN MACHINE CO., 51-57 10th St., Detroit, Mich.



An ad. like this will cost you $1.95 for each insertion.

MR. DEALER:

Last week we opened up this window so as to get you dealers interested in communicating with each other through this department.

The responses received so far prove our judgment was correct in emphatically bringing this opportunity to your attention. We believe the more we exploit its advantages

* From now on the circulation of The Motor World will be a guaranteed one, sworn to by an affidavit, which will be sent in detail to any one upon request.

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For Sale—Wants—Exchange

15 cents per line of six words, cash with order. In capitals, 25 cents per line.

A market place where Dealers, Jobbers and Manufacturers may buy, sell or trade used cars, parts and appliances and where help or situations may be secured at a nominal cost.

FOR SALE—Pope-Hartford engine, 1910 model, fine condition, $125.00. BOX 211, care Motor World.

FOR SALE OR EXCHANGE, for automobile, not earlier than 1911 model, 40 ft. motorboat, 12 ft. beam, 2½ ft. draught, 6 ft. headroom cabin, sleeps four comfortably; toilet, wash basin, dory, 15 h. p. 2-cylinder Mianus motor; thoroughly equipped in every way, with full inventory; in commission; price, $800. Apply to E. SHUTTLEWORTH, 815 Vernon Ave., Long Island City, N. Y.

ONE 1-ton 20 horse and one 2-ton 30 horse new auto trucks at a bargain. CEDAR RAPIDS AUTO WORKS, Cedar Rapids, Ia.

AUTOMOBILES—A. C. C. A. Prices Talk! Every make. Every model. Hundreds runabouts, racy roadsters, five-seven passenger touring cars. $50 up. Guaranteed five years. Shipped Freight Prepaid! Write today for the largest Illustrated Catalog published! THE AUTOMOBILE AND CYCLE COMPANY OF AMERICA, Dept. I-N, 1769-1787 Broadway, New York City.

SALESMEN, one who is now visiting automobile trade or owners. Good money made on a very attractive proposition. STURDY MFG. CO., 2637 Michigan Ave., Chicago, Ill.

FOR SALE—5 passenger, 4 cycle Pope-Hartford, never run. BOX 209, care Motor World.

AGENTS WANTED — To handle the $1000 G. J. G. "Junior," racy, classy and specially designed chaseabout with 104-inch wheelbase, with a real 26 H. P. motor, Bosch magneto, Dorian remountable rims with 32 x 3½ tires, at a price of $1,000, which is a money-maker for the sales agent. Write for literature and discounts to G. J. G. MOTOR CAR COMPANY, White Plains, N. Y.

BROKEN CRANKSHAFTS, cylinders, crankcases, flywheels, gear teeth, pistons, perfectly welded and machined ready to replace. Guaranteed and references. Machinery up to 5 tons welded. ATLAS WELDING WORKS, 74-76-78 Irving St., Rahway, N. J.

EIGHTY up-to-date fore-poor five-passenger wood, solid one-piece bendings, automobile bodies, in color and filler. Will sell cheap. Write for particulars and price. Cause of sale, bodies left on hands on account of failure of concern. Write quick. THE SIDNEY MFG. CO., Sidney, Ohio.

AUTOMOBILE AGENTS—I want local agents in every county in the United States to handle a popular-priced line of automobiles; a good name and reputation for integrity counts more with us than money or experience; if you have $300 and can furnish bond you can procure the agency for our high-grade car and we will furnish you with demonstrator. For full particulars address R. C. LEWIS, Sales Manager, Box 55, Milwaukee, Wis.

CLIMATIC LINEN DUSTERS, direct to consumer, at regular wholesale price, $1.38 each. Featherweight silken raincoats, $4.50 each. Men's and women's; all sizes. Mention your dealer's name when ordering. CLIMATIC RAINCOAT COMPANY, 102 Fifth Ave., New York.

MAILING LISTS—750,000 auto owners. S. H. CARROLL, JR., Albany, N. Y.

FORD OWNERS—GET OUR CATALOG. AUTO PARTS CO., PROVIDENCE, R. I.

MOHAIR—DUCK—CANVAS—TOPS
Made to Look Like New.
PEERLESS AUTO TOP DRESSING
makes faded and strained tops a uniform black color, putting back the life that is worn out by the rain, sun and use. Leaking tops are waterproofed with one coat. Leaves the cloth soft and pliable. Anyone can apply it. Prices, 1 gal. $3.75; ½ gal. $1.90; ¼ gal. $1.00. Express collect. Have your dealer order.
THE COLUMBUS VARNISH CO.,
Columbus, Ohio.

ENAMEL YOUR LAMPS BLACK.
EXTRA FINE BLACK JAPAN.
The most elastic Enamel made. Dries in 10 to 12 hours. One or two coats may be used. Does not crack, chip or peel. Use on Lamps, Horns, Radiators, Fenders, etc. Air-drying. We also make the fine Baking Japan. Have your Garage or Supply Dealer order.
THE COLUMBUS VARNISH CO.,
Columbus, Ohio.

SCHEBLER CARBURETOR.
J. C. NICHOLS.
DIRECT FACTORY DISTRIBUTORS.
1673 B'way at 52d St., New York City.
Tel. 6161 Col.
Our new model L Carburetor with three speed adjustments, at half price by returning your old model Carburetor.

AUTOMOBILE WANTED
I WILL exchange Boston income property for used touring car, $500 to $3,000 value; will pay some cash if necessary. PITKIN, 209 Washington St., Suite 58, Boston, Mass.

FOR SALE AT REASONABLE PRICE.
One model D 1911 Chase Motor Truck. Overhauled by factory people, who advise it is in first class condition. For further details write. A. H. WINSLOW, Bennington, Vt.

the more successful it will be, therefore, we are going to continue these windows for the time being in order to talk to you weekly.

Remember, there are 8,000* weekly readers of the Motor World, 5,000 of whom are you dealers. You will find there is less waste circulation for you a dealer in this offer than can be duplicated by any other publication.



An ad. like this will cost you 90c. for each insertion.

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MICHELIN



Red Inner Tubes

Michelin Red Inner Tubes fit envelopes of same branded size without stretching. The normal thickness of the walls is maintained at all times.

Every user acknowledges the superiority of Michelin Tubes. **They are the admiration and envy of competitors.**

MICHELIN—MILLTOWN—N. J.

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Abbott-Detroit

Explaining Our Advertising Plans for the Coming Season

ABBOTT-DETROIT advertising for 1913 will be **different.** It will be our aim this year to tell the public and our dealers everything we can about Abbott-Detroit cars, the organization that makes them, the man who sells them and the man who buys them.

This advertising will appear in serial form in the weekly magazines and trade papers, each advertisement covering a certain portion of the car. The **chassis** will first be considered, after which the **power plant, clutch, transmission, control system, ignition, carburetor, cooling system, lubrication system** and all other important features will be carefully described and explained. Our policy will also be thoroughly discussed and interpreted.

This is the **first** time that any automobile manufacturer has ever done this, so **we urge you to follow the series carefully.**

"The demand of the day is that an organization shall be judged by its product and not by what it claims for itself"
Keep this in mind when you examine these 1913 models

Models and Prices

34-40	Fore-Door Roadster, 116-inch wheel base	$1700	44-50	7-Passenger, Fore-Door Touring Car . . . 121-inch wheel base	$2000
34-40	5-Passenger, Four-Door Touring car . . . 116-inch wheel base	$1700	44-50	Battleship Roadster 121-inch wheel base	$2150
44-50	5-Passenger, Fore-Door Demi-Tonneau . 121-inch wheel base	$1975	44-50	7-Passenger, Fore-Door Limousine . . . 121-inch wheel base	$3050

Advance Catalog on Request

ABBOTT MOTOR CO.
607 Waterloo Street DETROIT, MICH.

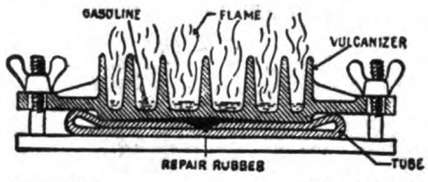


Remember—Abbott-Detroit Cars are
"Built for Permanence" and "Guaranteed for Life"

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Repairs the Inner Tube in 15 Minutes

SIMPLE — EASY — SURE



Nickel Plated Patent Pending

Price $3.50 Complete

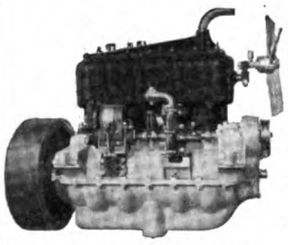
At your dealers, or sent by express.

Guaranteed to Satisfy

Address Dept. E.

McGRAW TIRE & RUBBER COMPANY
East Palestine, Ohio

"CONTINENTAL"



Best known motor in America. Look for the name "Continental" on the crank case. We have looked after the quality behind it.

4 and 6 Cylinders 20 to 60 H. P.

Continental Model "C" *Write for Booklets*

CONTINENTAL MOTOR MFG. COMPANY
Muskegon, Mich.

FACTORY REPRESENTATIVES:
K. F. Peterson, . 122 S. Michigan Blvd., Chicago
L. D. Bolton, ... 1810 Ford Bldg., Detroit

Argo Electric

For the Gentleman and Gentlewoman

Beautifully Finished – Perfectly Equipped Easily Operated
Send for the new Argo Electric Catalog.

ARGO ELECTRIC VEHICLE CO., Factories, Saginaw, Mich.
Metzger-Herrington Co., Distributors,
2412-14 Michigan Ave., Chicago.

STOP PAYING GARAGE RENT

Why Not Own Your Own Garage?

We are Manufacturers and Builders of Fireproof Steel Garages of all sizes. Write for Catalogue and prices.

THE FIREPROOF GARAGE COMPANY
1226 Ridge Avenue Philadelphia, Pa.

PREST-O-LITE
The Light Universal

Ask for full information on Prest-O-Lite Gas Tanks, Prest-O-Tire Tubes, Prest-O-Tire Tanks, Prest-O-Carbon Remover, Prest-O-Welder, Prest-O-Starter and Prest-O-Liter.

The Prest-O-Lite Co., 287 E. South St. INDIANAPOLIS, IND.

Perfection Spring Company

SPECIALISTS IN

Spring Suspension

High Grade Only

Cleveland, Ohio

Send Us Your Inquiries When in the Market for

Sheet Metal Stampings

Estimates Cheerfully Furnished

The Bossert Company
UTICA, N. Y.

Woodworth Treads

will help you to increase your business while benefiting your customers. We will send any responsible dealer a pair on 30 days' trial Write now. Good Agents wanted for unoccupied territory.
LEATHER TIRE GOODS CO., Niagara Falls, N. Y.

DISCO

The Self Starter



GRANT-LEES GEARS

The Grant-Lees Machine Co.
Cleveland, Ohio

REPUBLIC STAGGARD TREAD

The Tire Perfect!



The Republic Rubber Co.
Youngstown, Ohio.

Stop Fussing with Tires



Cut out the everlasting repairing!—the agony of punctures, blowouts, and delays Enjoy unrestricted pleasure—always, always—with
DAYTON AIRLESS TIRES
Air-Free—Care-Free—cannot give out.
They save any motorist hundreds of dollars.
Send now for big FREE BOOK of money-saving, pleasure-making information you need now. You can't get it quick enough. Splendid dealers' proposition.
Absolutely Proof Against Every Trouble
The Dayton Rubber Mfg. Co., 105 Elsor St., Dayton, O.

Kelly-Springfield Automobile Tires



In buying motor car tires, put your faith in a name that for fourteen years has stood for definite knowledge of road requirements and the quality to meet those requirements — Kelly-Springfield.

KELLY-SPRINGFIELD TIRE CO.
20 Vesey Street, New York

Branch offices in New York, Chicago, Philadelphia, Boston, St. Louis, Detroit, Cincinnati, San Francisco, Los Angeles, Seattle, Buffalo, Cleveland, Baltimore, Washington, Atlanta, and Akron, Ohio.

Boss Rubber Co., Denver, Colo.
Appel & Burwell Rubber & Tire Co., Dallas, Texas.
Bering Tire & Rubber Co., Houston, Texas.
Todd Rubber Co., New Haven, Conn.

"National" Steam Vulcanizers

GARAGE MODEL repairs three tubes and two casings at a time. Cheapest and best on the market. Get our special selling plan. Portable model for individual owners which will please your customers. List price, $12. Manufactured by

THE NATIONAL MOTOR SUPPLY CO.
1904 Euclid Ave. CLEVELAND, O.

The Otho System for Self Starting Lighting Ignition Signalling

"Is right" Inside the Flywheel

Otho Engine Co 60 State St. Boston, Mass.



RELIANCE

"The Speedometer of Quality"

Special features that eliminate speedometer troubles. Send for the booklet.

Reliance Speedometer Co.
134 Eliot St. Boston, Mass.

Red Head



REGISTERED U.S. PAT. OFFICE

Magneto Plugs coax maximum power out of engine.
EMIL GROSSMAN COMPANY, Mfr., New York and Detroit



Tones down headlights for city driving and foggy nights an auto necessity. Price 75c. per pair. Sell like hot cakes. Dealers, secure the agency quick.

F. H. TOBIAS
1931 Broadway, New York

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Aluminum Bodies
THE SPRINGFIELD TOP
(Pat. 1895)
SPRINGFIELD METAL BODY CO.
366 Birnie Avenue, Springfield, Mass.

THE ATWATER-KENT IGNITION SYSTEM
ideal for your motor, write for information-booklet D
ATWATER-KENT MFG. WORKS
46 North Sixth St., Philadelphia, Pa.

Reo the Fifth
Final and crowning achievement of R. E. Olds, pioneer designer of autos. A standard size 30 to 38 horsepower four cylinder car of modern refinements priced for the present at only $1,055.
(38) R. M. OWEN & CO., General Sales Agents
REO MOTOR CAR CO., Lansing, Mich.

$495.00 METZ 22 H. P. MOTOR CAR
The most economical car you can buy at any price. The Metz will run from 28 to 32 miles on a gallon of gasoline, over 8,000 to 10,000 miles on a set of tires. You can secure exclusive sale of these cars in your territory. Book "B" mailed free on request.
100 miles on a pint of
METZ COMPANY, Waltham, Mass., U.S.A.

LBA STORAGE BATTERIES
Class A for Electric Lighting
Class B for Electric Starting
Manufactured by
Willard Storage Battery Company
CLEVELAND, OHIO

GOODYEAR
AKRON, OHIO.
This name on Automobile Tires and Rubber Accessories signifies inherent qualities of material and workmanship that insure the maximum of service at the minimum of expense. (673)
The Goodyear Tire & Rubber Co., Akron, Ohio

MOTZ Cushion Tires
For Pleasure Cars and Light Delivery Cars
Send for Booklet 58
THE MOTZ TIRE AND RUBBER CO.
Executive Office: Akron, Ohio
A—Shows double, notched treads.
B—Shows undercut sides.
C—Shows slantwise bridges.
D—Shows absorbing means when passing over an obstruction
BRANCHES:
2033 Michigan Ave., Chicago — 900 Woodward Ave., Detroit
1727 Broadway, New York — 699 E. 15th St., Kansas City
1400 Race St., Philadelphia — 2252 Euclid Ave., Cleveland
Standard Tire & Rubber Co., 104-106 Portland St., Boston
Distributors for New England States

The NIAGARA Self Starter
Is "As Dependable as Niagara"
Simple as It Is Efficient
Good Territory Open
THE NIAGARA SALES COMPANY
704 Main Street Buffalo, N. Y.

Weed Chains

The Great Anti-Skid DEVICE

Nine-tenths of all accidents to automobiles are caused by skidding or slipping.

Either you skid into the "other fellow" or the "other fellow" skids into you.

No matter how careful a driver you may be, you cannot prevent skidding or slipping on wet, muddy snow-covered roads or on icy, slippery greasy pavements unless you equip your car with Weed Chains.

Cannot Injure Tires
Because They Creep

An absolute necessity on both rear wheels and if you want to know what real steering steadiness means put them on the front wheels too.

For your own safety—for the safety of the public, fully equip your car with Weed Chains. Make it your business to get a set today.

Recommended and sold by all reputable dealers

Weed Chain Tire Grip Co.
28 Moore St. New York

The Name "Weed" on Every Hook

Standard Bearings are Enemies of Friction.
Why Don't You "Standardize"?
Standard Roller Bearing Company
PHILADELPHIA

75% Increase in Tire Efficiency
That's what the INNERSHU accomplishes. It's a tough, durable, rubberized fabric formed permanently to tire shape. Ask for circular.
INNER SHOE TIRE COMPANY
Front Street Grand Rapids, Mich.

MAZDA LAMPS
FEDERAL MINIATURE LAMP WORKS
of the General Electric Co.
Cleveland and Chicago

Locomobile Cars for 1912
Complete information furnished on request.
The Locomobile Company
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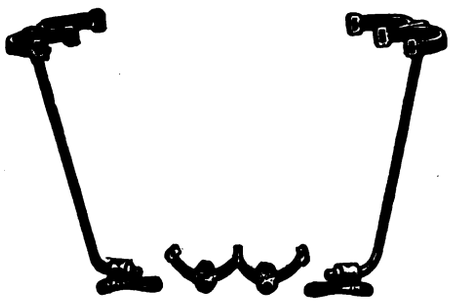
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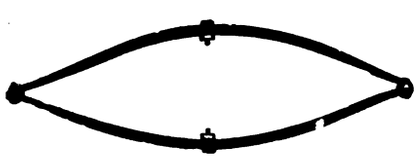
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DURABILITY proves the *quality* of automobile tires—it is a sure gauge.

Federal Tires will outwear the inferior kinds every time. Because of better construction and the use of carefully selected materials Federal Tires are capable of standing the severe strain and wear (both inside and outside) to which tires are naturally subjected. Unusual quality is the explanation of the *durability* of Federal Tires. *Investigate* them.



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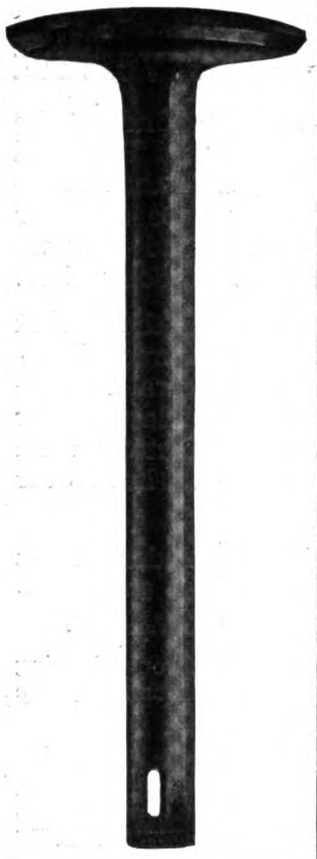
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Your engine leaves the factory running smoothly and sweetly—tuned up to its highest power. Perhaps the valves pit—warp - go out of shape—fail to hold compression. Then the power diminishes, and what can be more aggravating to the driver, who has known the fullness of the pulling power of his motor, than to have it grow less and less?

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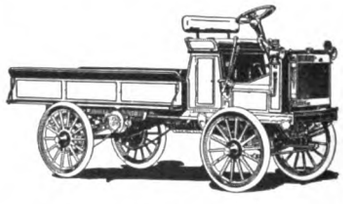
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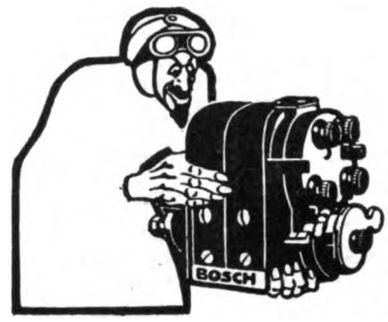
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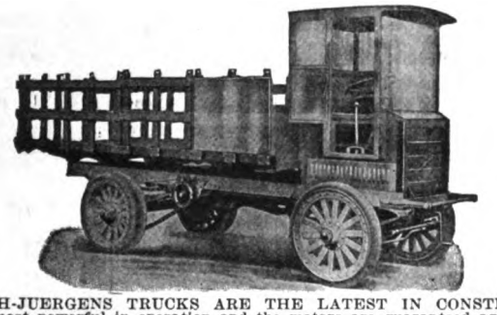
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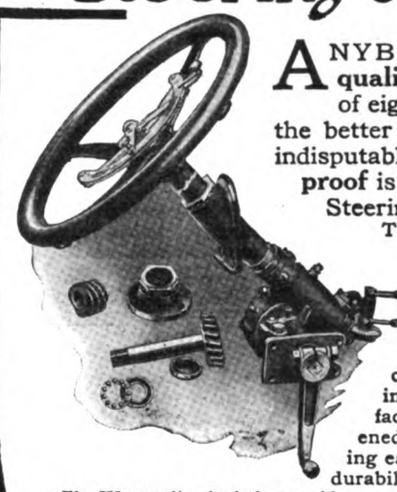
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$1,675	$2,150	$2,750

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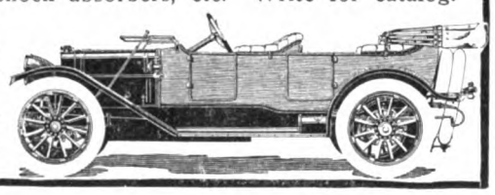
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He insists that this is tire economy and

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SCHRADER UNIVERSAL Tire Pressure Gauge

(Trade Mark Registered in U. S. Patent Office)



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The *Pioneer* Moderate Priced Six-Cylinder Car

HAVERS - SIX - HAVERS MOTOR CAR CO.

Havers Self-Starting "Six-44"



Price $1850

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4 and 6 Cylinder Motors
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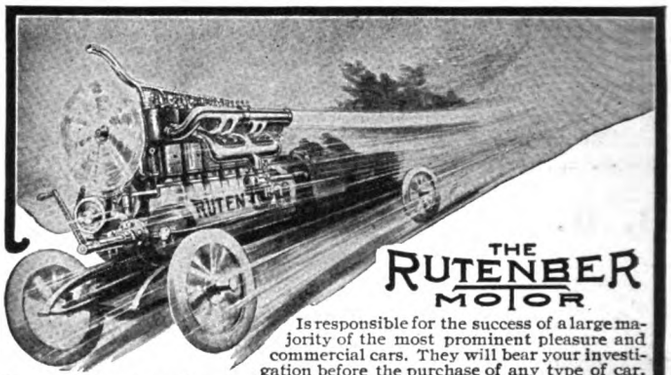
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One Quality in All Models

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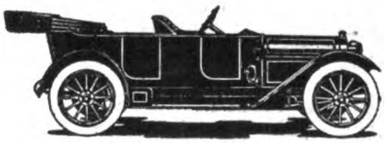
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Climbs a 50% grade—Friction Transmission—any number of speeds. Five models—write.

CARTERCAR COMPANY, Pontiac, Michigan

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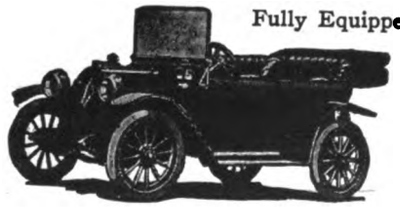
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Fully Equipped

Five Passenger Touring Car



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Enclosed Valves, Three Point Suspension, Unit Power Plant, Platform Rear Springs, Full Floating Axle, Left Hand Drive, Center Control, Drop Frame, Large Tires, Complete Ball Bearing Car. Write for specifications.

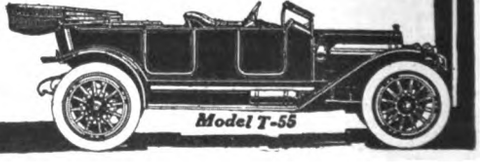
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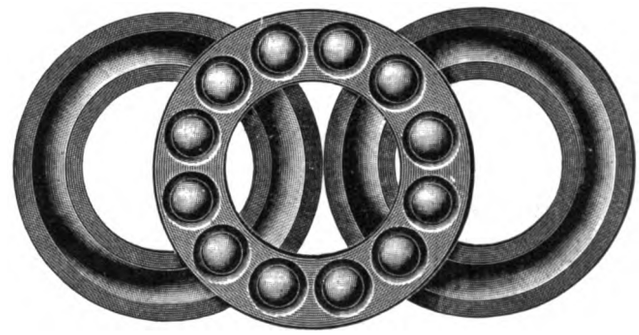
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The one weak point of the automobile is that you cannot depend on the tires. Thousands of motorists have solved their tire problem by discarding inner shoes, reliners, fillers and other makeshifts and equipping their tires with **Interlock Inner Tires.**

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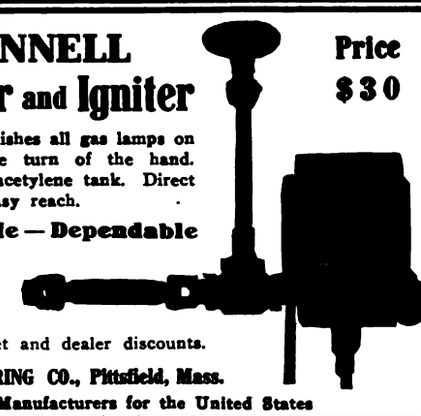
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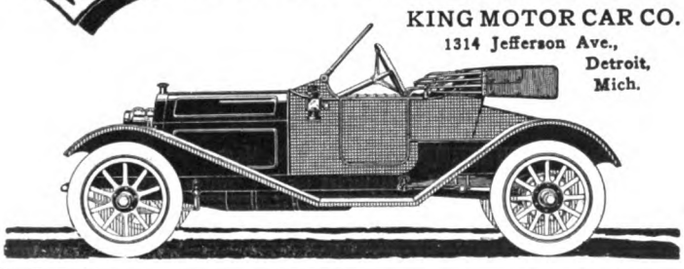
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Jencick Motor Corporation
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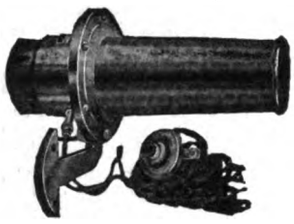
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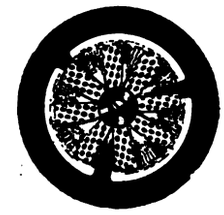
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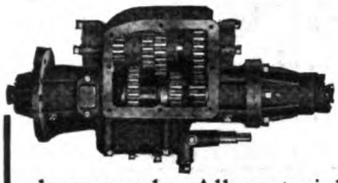
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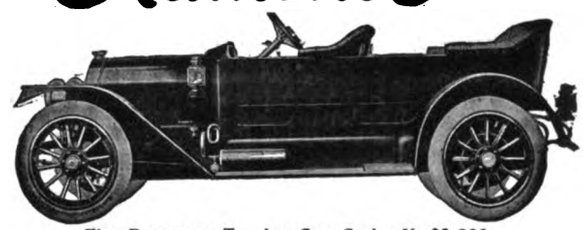
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Five Passenger Touring Car, Series V, $2,900
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A new type of six—a small one.

Some sixes weigh twice as much. No other six weighs so little and no other is so compact.

Motor only thirty-horse-power—good as sixty-horse-power for what a man wants—the car itself is so light.

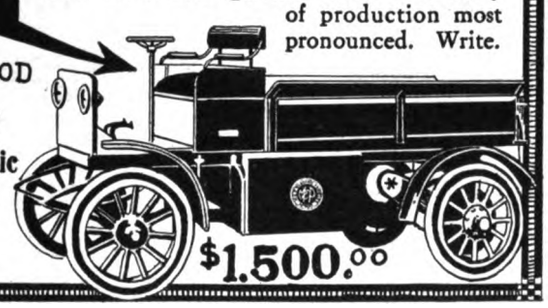
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The Car with a Conscience
All Four Cylinder Models
$1200 to $3000
30, 40, 45 Horse Power Ratings
Limousines, Touring Cars, Coupes and Roadsters
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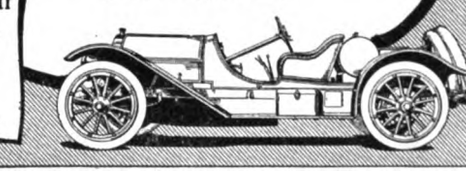
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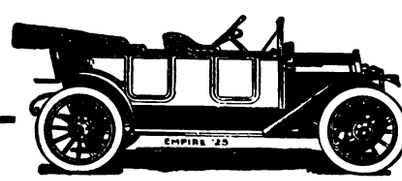


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THE SPEEDWELL MOTOR CAR CO.
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2-Passenger
Equipped
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Empire Twenty-Five
"The Little Aristocrat"

This is the Big Brother of the Famous Empire Roadster and is a small edition of $5,000 cars.

Hence the price of $850 puts this car in a class by itself. Specifications prove the Empire 25 to be the most "aristocratic" little touring car in America. Write for details today.

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Hupmobile

Long-Stroke "32"
Touring Car
$900 F. O. B. Detroit

Motor 3¼ x 5½ inches; four cylinders; Bosch magneto; three speed sliding gears; tires 32 x 3½ inches; 106 inch wheelbase. Equipment includes windshield, gas headlights, generator, oil lamps, tools and tire repair kit.
Roadster body on same chassis and with same equipment, $900 F. O. B. Detroit.

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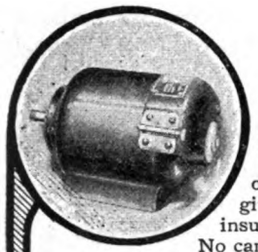
Runabout—$750
F. O. B. Detroit. Same power plant as World-Touring Car. Wheelbase, 86 inches. Equipment of top, windshield, gas lamps and generator, oil lamps, horn and tools.

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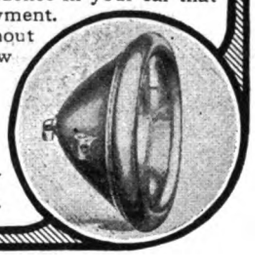


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The equipment that robs night driving of all its annoyances and dangers and gives you the confidence in your car that insures perfect enjoyment.

No car is complete without an Aplco System. Specify it on your new car or write us about our outfits to bring your old car up-to-date.

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For Motorists Who Demand the Best.



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$30.00 for a **$105.00** 6 cylinder
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Imported U. & H. High Tension Magnetos Less Than Import Cost

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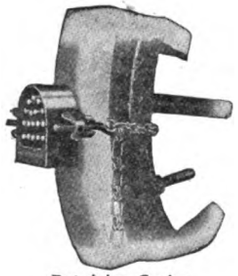
The One Mechanical, Never Failing Warning Device

Costs Little to Buy—Costs Nothing to Operate

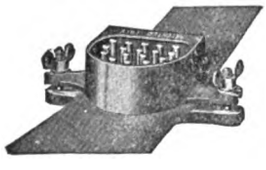
No Battery—No Wire—No Bulb—No Motor to break down or fail to work.

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TIRE CUTS ruin casings. They admit moisture to the carcass, cause the fabric to rot and weaken, grow larger and in blowouts.

You can repair **CASINGS** and **INNER TUBES** anywhere in 15 minutes, better than a Repair Shop can do—and for *one cent.*

Universal Auto-Vulcanizer
Patented

A practical vulcanizing outfit complete, with enough repair gum to make 40 patches. It weighs 3 pounds and can be carried in the tool box. **Simplest and most satisfactory device for eliminating tire troubles that has ever been devised.**

Absolutely automatic. Place the patch—attach the Vulcanizer—put in the gasoline light it. No further attention required. In 15 minutes the job is done.

It *can't burn, scorch* or *injure* tube or casing. It *can't* get out of order. It *can't* fail to do its work. So simple, anyone can operate it. The Universal Auto-Vulcanizer saves its cost a *hundred times* over in trouble and expense.

Price Complete, **$4.00** Ready for Instant Use
Guaranteed Satisfactory or Money Refunded

ADAMSON MFG. COMPANY, East Palestine, Ohio

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should break their journey and avail themselves of the excellent facilities afforded by the D. & C. Lake Lines, operating daily service between Detroit and Buffalo and Detroit and Cleveland.

Enjay the delights of the cool breezes from Lake Erie and resume your journey in the morning after a refreshing night's rest. Special attention given by this Company to the handling of automobiles. Rates quoted on application (state wheel base); Tanks of Automobiles must be emptied of gasoline before being shipped; three gallons of gasoline supplied free on arrival at destination.

Roads in this section of the country are in first class condition; new road now under construction between Detroit and Toledo. Tourists speak highly of the route between Buffalo and New York.

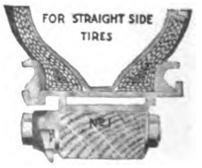
On your trip this summer bear in mind "The Waterway is The Only Way."

DETROIT & CLEVELAND NAVIGATION CO.,
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Standard Universal Rims



fit any style or make of tires. The side rings are reversible, they curve outward on one side to fit a straight side tire, inward on the other to accommodate a clincher. Two turns of a nut unlocks the rim for demounting, two more turns locks the rim in place. Write for catalog 607, which explains fully.



THE UNITED RIM COMPANY, Akron, Ohio

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KLAXON

THOUSANDS

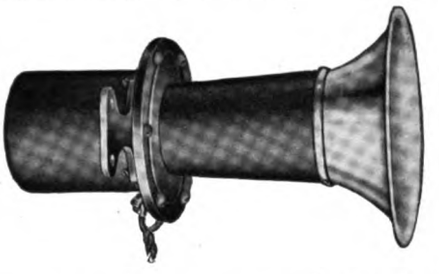
THERE are thousands of car owners ready to install the Klaxet.

Those who have found how uncertain, how ineffective, how utterly useless — is the *bulb-horn*.

Those who have fumbled with foot and string contrivances of "exhaust" signals — who have tried in vain to sound a warning when the engine was running slack, and obtained but a feeble "sputter" — or who, oftentimes when they needed a signal most, found it clogged with soot and carbon — and *silent*.

Those who have tried the electric "buzzer" — operating on the principle of a door-bell — have heard it gradually grow weaker and weaker, its sound resembling more and more each day the nasal, lifeless "honk" of the bulb-horn — have finally discarded it, retaining from the experience only the knowledge of the immense convenience of simply having to "press the button."

KLAXET



MOTOR DRIVEN **$12**
(Complete with wire and push-button)

OPERATES on exactly the same principle as the Klaxon and Klaxonet — a steel diaphragm vibrated by a motor-driven rachet wheel :: Sold under the regular Klaxon guarantee.

Orders will be accepted after Aug. 15th :: Deliveries Sept. 1st.

These motorists have learned by an expensive process of elimination that the logical, the dependable, the invariably satisfactory, the *ultimate* type of warning signal is that *operated by an electric motor*.

Hitherto the sole obstacle in the path of its universal use has been the *price*. And now this is overcome in the Klaxet at TWELVE DOLLARS.



KLAXONET

Lovell-McConnell Mfg Company Newark, N.J., U.S.A.

KLAXON

"The Public Safety Signal"



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Studebaker

The All Important Question of Up-Keep Cost

More important even than the question of car price is the question of up-keep cost. Car price is at least known and definite, but up-keep leads into the trackless and unknown.

Foreknowledge on this important item means either a profitable car investment or a steady financial drain that makes car-ownership an expensive and exasperating luxury.

Studebaker cars have not only successfully solved the question of a high-quality car at a low price, but at a cost for maintenance and operation that puts them within comfortable reach of everyone.

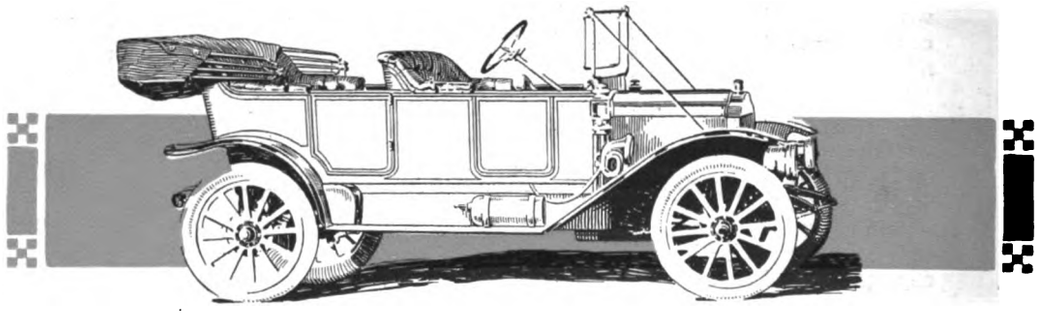
The light-running car was the first step in solving this problem of up-keep cost and the success of the Studebaker Cars—realized after years of testing and experiment—has revolutionized car building.

Into these cars have been put the same quality of material and workmanship, the same beauty of design, the same comfort, the same service as in the high-priced heavy touring cars whose cost for operation limits them to wealthy owners.

The light-running car is the car of today and of the future, and is in demand by wealthy owners as well as those of moderate incomes.

The wonderful serviceability of the Studebaker Car, their low running cost and ease of operation have endeared them to seventy-five thousand owners.

Up-keep cost is a big selling argument, and this great factor in the selling strength of these cars should not be overlooked either by dealers or owners.



The $800 Studebaker (Flanders) "20"

Equipped with Top, Windshield, Prest-O-Lite Tank and Speedometer, $885 f.o.b. Detroit

STUDEBAKER CARS

(Nickel Trimmed)

STUDEBAKER (FLANDERS) "20"	
Touring Car	$800
Roadster	750
Utility Car	800
Delivery Car	800

STUDEBAKER (E-M-F) "30"	
Touring Car	$1100
Detchable Demi-Tonneau	1100
Roadster	1100

See our dealer. You can get prompt delivery. Our Art Catalog A-9 is yours for the asking.

The Studebaker Corporation Detroit, Michigan

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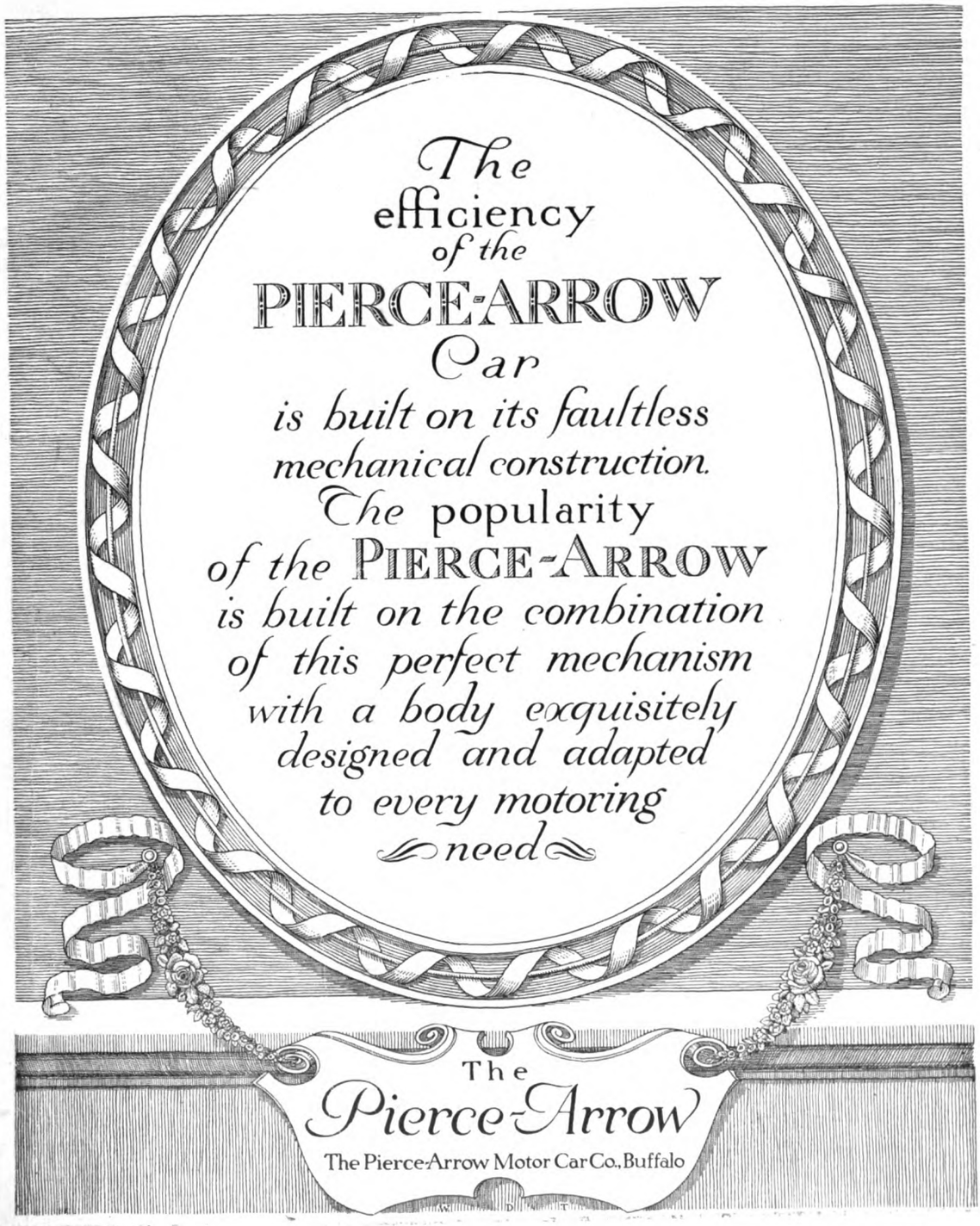
THE MOTOR WORLD

A Trade Paper Giving the World's Motor News

Vol. XXXII
No. 8

New York, August 15, 1912

Ten cents a copy
Two dollars a year



Published Weekly by The Motor World Publishing Company, 1600 Broadway, New York

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Why? Mr. Dealer

Every article of equipment which a car manufacturer uses adds to his cost of production. The essentials first merit his consideration; after them the incidentals are considered.

Glance over this list below. Here are makes of cars that have the

Truffault-Hartford SHOCK ABSORBER

as regular factory equipment. Many of these cars have been Truffault-Hartford-equipped for several seasons:

Packard	Thomas	Alco
Oldsmobile	Hudson Six	Marmon
Simplex	Stevens-Duryea	Rambler
Columbia	Stoddard-Dayton	Mercer
Fiat	Velie	Benz
Brush	Corbitt	McFarland

Why don't you as a dealer insist that the car manufacturer, who wants you as his agent, equip his product with Truffault-Hartford Shock Absorbers, the same as these keen buyers of equipment listed above?

A blue-print of this manufacturer's car, which we furnish, will help you as a dealer in attaining this result. Write us for further information. We want to keep in touch with all live dealers.

HARTFORD SUSPENSION COMPANY

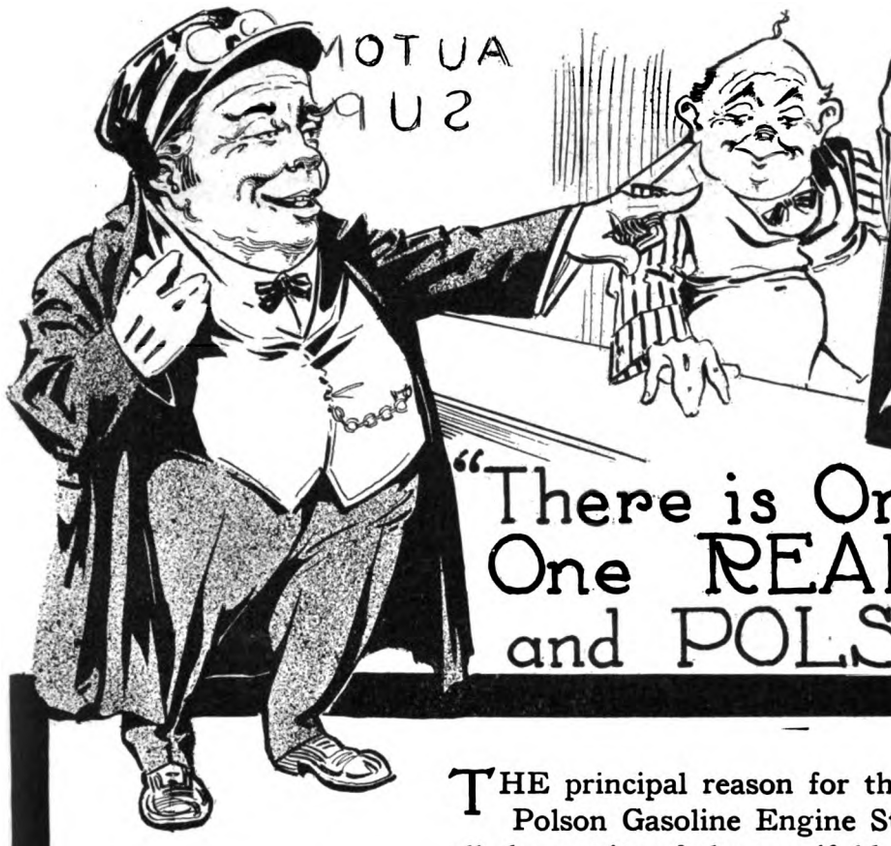
164 Bay Street — **Jersey City, N. J.**

EDW. V. HARTFORD, President

BRANCHES

NEW YORK, 1700 Broadway
NEW YORK, 212-14 West 88th St.
CHICAGO, 1458 Michigan Ave.
BOSTON, 325 Columbus Ave.
PHILADELPHIA, 1437 Vine St.
NEWARK, 289 Halsey St.
KANSAS CITY, 1524 Grand Ave.
DETROIT, 803 Woodward Ave.
JERSEY CITY, 143-145 Morgan St.
ASBURY PARK, Ocean and Third Aves.
BRETTON WOODS, N. H., care Bretton Woods Garage.
INDIANAPOLIS, 448-50 No. Capital Blvd.

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The POLSON Gasoline Engine Starter

"There is Only One REAL Starter and POLSONS is IT"

THE principal reason for the unquestioned superiority of the Polson Gasoline Engine Starter is the fact that it combines all the merits of the manifold system with all the merits of the selective cylinder system. By simply turning the dash lever of a Polson Gasoline Engine Starter you charge not only the cylinders with gas but the manifold as well. For this reason it is certain to start the engine, provided a spark is obtained in the cylinder.

Dealers need have no hesitancy in handling the Polson Starter, because of any unfavorable experience with other starters.

We stand back of our starter to the limit. A full guarantee goes with every starter. Our prices are right and our dealers' discounts are right. There is still some good open territory for the right men. Get in touch with us.

In addition to the Polson Gasoline Engine Starter, the Polson Mfg. Co. are manufacturers of everything in brass from blue prints or samples.

There is no windshield on the market that is the superior of the Polson windshield, which is sold under an absolute guarantee without any time limit. This windshield is positive, rigid, cannot rattle, and for ease and simplicity of adjustment has not an equal on the market today. Each windshield is built and designed to conform to the particular style and make of car upon which it is intended to be used. The glass used is one-quarter inch selected plate and the dashes are finished in any color desired and are made of the choicest materials.



Polson's Automatic Folding Auxiliary Seats illustrated herewith, are delivered in the white or all metal parts, enameled and trimmed, as desired. These folding seats are automatic in that they stay in the position in which they are placed without the use of straps or locks of any sort. They are automatic in the same sense that a windshield is automatic in staying in the position and at the angle in which it is set.

Polson's products are not quantity products—they are quality products. We take only such business as we can produce in a style entirely up to our standard of excellence. If you are looking for quality goods at the right price, get in touch with Polson.

POLSON MANUFACTURING COMPANY, 27 Chenango Street, Buffalo, N. Y.

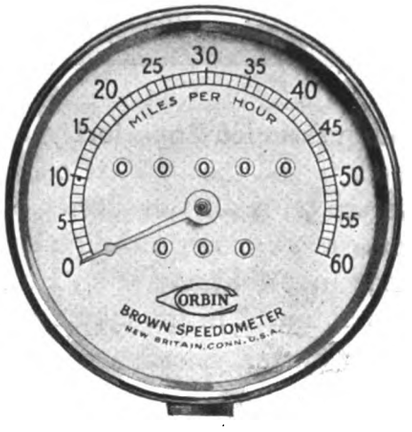
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The Corbin Screw Corporation Announce

The Manufacture and Sale of the

CORBIN-BROWN SPEEDOMETER

"The Speedometer of *Permanent* Accuracy"



The name "Corbin"—identified with manufacturing for more than 40 years and recognized as a guarantee of quality—will now also be a guide to absolute speedometer satisfaction.

The device, heretofore known as the Brown Speedometer but embodying new and invaluable improvements that overcome a fault common to other speedometers by insuring ***permanent*** accuracy, will hereafter be manufactured by the Corbin Screw Corporation and sold under the name of the Corbin-Brown Speedometer.

Write Today for Catalog

The Corbin Screw Corporation Division
(The American Hardware Corporation)
213 High Street New Britain, Conn.
Branches: **New York, Philadelphia, Chicago**

ADVERTISERS INDEX

A

Abbott Motor Car Co..... 66
Adamson Mfg. Co..... 80
Ajax-Grieb Rubber Co..... 77
American Ball Bearing Co... 60
American Lava Co..... 44
American Motors Co..... 74
American Starter & Carburetor Mfg. Co..... 72
Argo Electric Vehicle Co..... 68
Atwater Kent Mfg. Works.... 76
Automobile Supply Mfg. Co.. 73

B

Badger Brass Mfg. Co..... 72
Bantam Anti-Friction Co..... 71
Barthel, Daly & Miller..... 65
Bartholomew Co. 61
Benz Auto Import Co..... 68
Billings & Spencer Co..... 65
Bosch Magneto Co..... 69
Bossert Co. 77
Bretz Co., J. S..... 80
Briggs-Detroiter Co. 74
Brown-Lipe-Chapin Gear Co.. 71
Bush Mfg. Co..... 76

C

Cartercar Co. 74
Champion Ignition Co..... 70
Champion Spark Plug Co..... 70
Clark-Carter Automobile Co. 42-43
Classified Advertising 78-79
Cole Motor Car Co..... 74
Colonial Electric Car Co..... 72
Consolidated Mfg. Co..... 72
Continental Motor Mfg. Co... 77
Corbin Screw Corporation.... 2
Covert Motor Vehicle Co..... 73

D

Dayton Auto Truck Co..... 72
Dayton Rubber Mfg. Co..... 77
Dean Electric Co..... 45
Detroit & Cleveland Navigation Co. 80
Diamond Chain & Mfg. Co... 70
Diamond Rubber Co..... 70
Double-Fabric Tire Co..... 66

E

Electric Welding Products Co. 73
Empire Automobile Co..... 73

F

Fedders Mfg. Works..... 3
Federal Miniature Lamp Wks. 76
F. I. A. T..... 72
Fireproof Garage Co..... 77
Firestone Tire & Rubber Co.. 66
Ford Motor Co..... 75
Franklin Automobile Co..... 4
Fulton-McCutchan Co. 64

G

G. C. A. Mfg. Co..... 71
Goodyear Tire & Rubber Co.. 76
Grant-Lees Machine Co..... 77
Great Northern Hotel..... 68
Grossman Co., Emil..... 77

H

Hartford Suspension Co., Inside front cover
Havers Motor Car Co..... 74
Hayes Mfg. Co..... 52
Haynes Automobile Co..... 72
Hodge & Graves Co..... 70
Hupp Motor Car Co..... 73
Hyatt Roller Bearing Co..... 71

I

Ignition Starter Co..... 77
Inner Shoe Tire Co..... 76
International Harvester Co. of America 62
Inter-State Automobile Co.... 75

J

J. M. Shock Absorber Co..... 65
Jackson Automobile Co..... 37
Jeffery-Dewitt Co. 80
Jencick Motor Corp..... 56
Jones & Co., Phineas..... 71
Jones Speedometer 80

K

Kellom Co., Chas. F..... 76
Kelly-Springfield Tire Co..... 63
King Motor Car Co..... 66
Kinsey Mfg. Co..... 71



Digitized by Google

ADVERTISERS INDEX

Kissel Motor Car Co..... 66
Kline Motor Car Corp..... 74
Knight-Davidson Co. 75
Knox Automobile Co..... 59

L

Lauth-Juergens Motor Car Co. 69
Leather Tire Goods Co..... 77
Locomobile Co. 76
Lovell-McConnell Co., Inside back cover

M

McCue Co. 47
McGraw Tire & Rubber Co.... 77
Metz Co. 76
Michigan Motor Car Co..... 75
Michigan Crank Shaft Co..... 76
Miller, Chas. E..... 63
Minerva Hardware Mfg. Co... 46
Mosler & Co., A. R..... 64
Moss Photo Engraving Co.... 69
Motor Car Equipment Co..... 76
Mott Wheel Works..... 80
Motz Tire & Rubber Co..... 64
Mutty Co., L. J..... 76
M & P Electric Vehicle Co... 73

N

National-Acme Mfg. Co..... 76
National Motor Vehicle Co... 73
New Departure Mfg. Co..... 77
Niagara Sales Co..... 67
Nordyke & Marmon Co..... 75
Nyberg Automobile Works... 46

O

Otho Motor Co..... 38
Owen & Co., R. M..... 76

P

Parish & Bingham Co..... 71
Penn Spring Works..... 77
Perfection Spring Co..... 77
Piel Co., J..... 80
Pierce-Arrow Motor Car Co., Front cover
Polson Mfg. Co..... 1
Pope Mfg. Co.....40-41
Premier Motor Mfg. Co.....50-51
Prest-O-Lite Co. 77
Pullman Motor Car Co..... 48

R

R. C. H. Corporation..... 75
Regal Motor Car Co..... 58
Reliance Speedometer 77
Remy Electric Co..... 68
Republic Rubber Co..... 75
Royal Equipment Co..... 70
Rutenber Motor Co..... 74

S

Schrader's Sons, A., Inc..... 67
Shawmut Tire Co..... 72
Sheldon Axle Co..... 54
Smith Co., A. O..... 71
Sparks-Withington Co. 62
Speedwell Motor Car Co..... 73
Splitdorf Electrical Co..... 70
Springfield Metal Body Co.. 76
Standard Roller Bearing Co... 76
Standard Welding Co..... 49
Stearns Co., F. B..... 57
Stewart Motor Corporation... 33
Streator Motor Car Co..... 36
Stromberg Motor Devices Co.. 55
Studebaker Corporation. Back cover

T

Timken-Detroit Axle Co..... 53
Tobias, F. H..... 77
Twitchell Gauge Co..... 61

U

United Rim Co..... 80
United States Tire Co..... 64

V

Valentine Co., J. H..... 66
Volkmar Auto Starter Co..... 70

W

Warm Hand Steering Wheel Co. 39
Warner Gear Co..... 67
Warner Instrument Co..... 69
Weed Chain Tire Grip Co.... 76
Willard Storage Battery Co... 76
Willys-Overland Co. 34-35
Wisconsin Motor Mfg. Co.... 75
Woodstock Hotel 65

Fedders SQUARE TUBE RADIATORS



Efficient

Economical

No radiator yet devised more than approaches the perfection of Fedders square tube radiators. Not alone are they the most efficient but they are the most durable and serviceable as well.

In the event of accident or damage the square tube radiator is easily repaired by any tinsmith while other radiators require special work and special tools—which means more cost and more time.

However, we will furnish any type or size of radiator desired. Send us your blue prints and we will furnish you with a detailed report as to cost, etc.

Fedders Mfg. Company
BUFFALO NEW YORK



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FRANKLIN "LITTLE SIX"

A 30 Horse Power Six-cylinder Car $2800

A small powered six.

A new type of car—a light six.

Some sixes weigh nearly twice as much.

No other weighs so little nor is so compact.

Motor is only thirty horse-power—a big motor is not required in a light car.

In a motor so small, the flexibility and smooth running of six-cylinder construction are very pronounced.

Announcements of new models show that nearly all sixes are running to heavy weight and high power. This means harder driving, less comfort and increased cost.

The Franklin "Little Six" is the other type—light weight, resilient, medium powered—easy to drive, comfortable to ride in and economical to run.

The extreme satisfaction derived from light weight and medium size makes the "Little Six" a universal car.

Beauty of design is another characteristic of the "Little Six." It is a graceful car. The lines of the smooth flush-sided body blend perfectly with the sloping hood, giving an atmosphere of distinctive individuality.

Franklin direct cooling is the simplest, most efficient system built. Nothing to freeze in winter, no boiling or overheating in summer.

The Quaker City Motor Club barred air cooled cars out of their economy contest. This is a good thing to bear in mind, if you are ever called upon to compare the relative efficiency of water-cooled and air-cooled cars.

Lubrication is by re-circulating system. One gallon to four hundred miles of running is the average oil consumption. Smoking is entirely done away with.

Send for "Little Six" booklet. Catalogue of all models mailed on request.

FRANKLIN AUTOMOBILE COMPANY

Syracuse N Y

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THE MOTOR WORLD

Vol. XXXII New York, U. S. A., Thursday, August 15, 1912 No. 8

POPULAR PRICED CARS REDUCED

Overland and Buick Pare Lists Slightly But Cadillac Increases—Full Equipment Included With All.

Apparently there is to be considerably less price slicing among the manufacturers of moderate priced cars than at first was supposed would be the case, if the lists which have been made public by the Willys-Overland Co. of Indianapolis, Ind., the Buick Motor Co. of Flint, Mich., and the Cadillac Motor Car Co. of Detroit, Mich., can be taken as a fair indication of what may be expected.

Although the prices of the five cars included in the Overland line have not been reduced except in one instance, the 45-horsepower model now listing at $1,475 instead of $1,500, but instead have been increased from $900 to $975, the increase, paradoxical as it may seem, really is in the nature of a reduction, the reason being that for the first time they are sold fully equipped. Incidentally, the reduction of the price of the largest model in the line is more substantial than at first appears for the same reason. Buick prices remain practically stationary, though, as in the case of the Overland line, each of the cars now is sold fully equipped. In the case of the Cadillac line, a slight advance has been made, the roadster, phaeton and standard touring models listing at $1,975 instead of $1,800, and the price of the coupe having been advanced from $2,250 to $2,500, the change representing additional equipment which heretofore has been listed as "extra."

United Motor Disposes of Buffalo Branch.

The United Motor Buffalo Co., which heretofore has been operated as a factory branch by the United States Motor Co. and which has, as its name suggests, handled the products of that company in Buffalo and environs, has passed out of the hands of the parent company. Charles F. Munroe, who for the past eight years has been its manager, has purchased the Buffalo company, lock, stock and barrel, and will continue the business along the same general lines as have obtained in the past. His territory embraces all of Northern New York and the western part of Pennsylvania.

Marmon Adds Light Delivery Wagon.

The Nordyke & Marmon Co., of Indianapolis, Ind., builder of the Marmon car, has brought out a light delivery wagon of 1,200 to 1,500 pounds capacity on a chassis that, naturally, has many of the earmarks of the Marmon touring car, but is of heavier construction throughout. The motor is the same as that of the pleasure car, except that the bore is reduced from 4½ to 4 inches, the stroke remaining at 5 inches; an automatic governor limits the speed of the wagon to a maximum of 20 miles an hour. Rear wheels are 32 inches in diameter with 4-inch dual pneumatic tires; the wheelbase is 120 inches. Deliveries of the new vehicles will be commenced within the week.

Atlas Sale Again Postponed.

Contrary to expectations, the sale of the Atlas Engine Works, of Indianapolis, Ind., which originally was scheduled for July 29th, but which was postponed to take place on August 12th, did not take place on that date, and according to present indications neither M. L. Thomson, who is attorney for the Baldwin Locomotive Works, of Philadelphia, Pa., and is said to represent other interests, nor Walter E. Flanders, will take over the property, both of these men formally having withdrawn their offers.

Cole Inaugurates Branch in Detroit.

Defying the "carrying coals to Newcastle" idea, the Cole Motor Car Co., of Indianapolis, last week opened its branch at Woodward and Willis avenues, in Detroit. D. M. Trombley is temporarily in charge of it.

DYER PATENT LITIGATION ENDED

Automobile Board of Trade Secures Licenses for its Members—"Outsiders," However, Are not Covered.

After prolonged litigation and negotiations between the Automobile Board of Trade and the Enterprize Automobile Co., which controls the Dyer transmission patents, Nos. 885,986 and 921,963, the infringement suits instituted twenty months ago in United States District Court for the Southern District of New York by the latter against the Locomobile Co. of America, the Winton Motor Carriage Co. and Maxwell-Briscoe, Inc., were settled this week by an agreement whereby members of the Board of Trade are permitted to manufacture under the Dyer patents. These, with five other Dyer patents, Nos. 643,595, 657,650, 662,400, 662,401 and 676,223, to which rights were secured in 1905 by the Association of Licensed Automobile Manufacturers, the Board's predecessor, cover practically all forms of sliding gear transmissions in use in cars at the present time. Since the agreement covers only the companies included in the Board of Trade, "outsiders" will have to adjust their own differences with the Enterprize company, which is composed principally of Leonard H. Dyer, a New York attorney. The agreement covers all seven patents and grants more inclusive rights to the group of five.

That the settlement was anticipated was forecast in the Motor World of August 1, which dissipated a common impression that suits against the more prominent manufacturers had been neglected while the Enterprise company was contenting itself with actions against individual owners, who generally were licensed at the rate of $25 per car and who chose to settle rather than to stand the expense of litigation, which is one reason the patents never were adjudicated. Lack of adjudication, however, was not regarded as a weakness in the patents,

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as the Board of Trade long realized their far-reaching character and caused a delay in its suits pending negotiations. That better known companies were not sued was due to the fact that settlement in the Locomobile, Winton and Maxwell-Briscoe suits was expected.

Although the basis of settlement is not divulged, the value of the license fees to the Enterprize company is indicated to be considerable by the case against the Palmer & Singer Mfg. Co., which has not yet been decided, this company not being a member of the Board of Trade. It is understood that what was considered by the Enterprize company as a reasonable offer of settlement was made to the Palmer & Singer company on the basis of one-fifth of 1 per cent.

The Palmer & Singer action has been fought separately from the actions against those firms within the board, and while a decree pro confesso recently was secured against the defendant, the Palmer & Singer company has intimated that it will fight to a finish.

Atlas Motor Car To Resume.

If the negotiations which at present are pending result as expected, it is altogether likely that the Atlas Motor Car Co., of Springfield, Mass., which recently was shut down by reason of the inability of the company to obtain the Knight engines with which its cars were equipped, will resume operations in the very near future. In order to alleviate the present stringency, it is proposed either to increase the capitalization to $100,000 or to consolidate the company with one of two other going automobile concerns, with which negotiations are pending. Just what the companies are, however, is not divulged. Pending developments in the sale of the Atlas Engine Works, of Indianapolis, upon which the Atlas Motor Car Co. is practically dependent, its matters are virtually at a standstill, though it is expected that they will be brought to a head within ten days.

Radford Now Head of Cartercar.

Harry S. Radford, who for several years has been sales manager for the Cartercar Co., of Pontiac, Mich., was elected to the office of vice-president and general manager of that company at a meeting of the board of directors of the General Motors Co., of which the Cartercar company is a subsidiary. In his new position Radford will have supervision over the engineering, purchasing, manufacturing and advertising departments, and in addition will be at the head of the extensive selling organization, which includes branches in New York, Philadelphia, Detroit, Chicago, Kansas City, Omaha and San Francisco.

To Produce New Rotary Valve Motor.

To develop a new type of motor, which is styled the Vixen and has rotary valves, and to control the rights under which it is manufactured, the Vixen Motor Co. has been incorporated under Indiana laws with headquarters in Indianapolis. The officers of the company are Fred C. Schmid, president; William J. Harris, vice-president, and C. O. Van Horn, secretary and treasurer.

To Handle Franklin Cars in Washington.

The Franklin Sales Co., of North Yakima, Wash., has been organized to conduct a general automobile sales business and will have the agency for the products of the Franklin Automobile Co., of Syracuse, N. Y. The officers of the company are John A. Nichols, Jr., president; George C. Arrowsmith, vice-president, and Thomas R. Robinson, secretary and treasurer. The headquarters and salesroom of the company will be located in a new building which is being erected on North Third street. It will be ready for occupancy September 1st.

Making Larger the Fisk Tire Plant.

By way of providing for a material increase in production, the Fisk Rubber Co., of Chicopee Falls, Mass., is preparing to make extensive additions to its already large plant. Contracts have been let for two buildings, one of which is to have six stories and basement, with overall dimensions of 250 feet by 60 feet, and the other is to have four stories and basement, the dimensions being 200 feet by 60 feet. It is expected that the buildings will be completed and the machinery installed by November 1st, when the capacity of the plant will be increased 50 per cent.

'Frisco's Pioneer Jobbers Separate.

L. H. and B. I. Bill, of San Francisco, who constituted one of the first automobile supply jobbing houses on the Pacific Coast, have dissolved partnership. The business will be continued by Bernard I. Bill in his own name. The chief accounts are Solar lamps, Diamond chains, Vesta lighting systems and Panhard oils. As a matter of fact, however, Louis H. Bill has not been particularly active in the business for several years, or since he assumed the management of the Rambler branch in San Francisco.

Another Carriage Builder Takes Up Trucks.

William N. Brockway, who has been engaged in the carriage building industry since 1851 and who claims to operate one of the largest carriage plants in the world, has organized the Brockway Motor Truck Co., capitalized at $250,000. It is located in Homer, N. Y., where the Brockway carriage factory also is situated. Three types of motor trucks will be produced, of the following capacities: 1,000 to 1,500 pounds, 2,000 to 2,500 pounds and 3,000 to 3,500 pounds. They will mount an air-cooled, two-cycle motor.

Goodrich and Case Ask "'Change" Listing.

B. F. Goodrich Co., which last May purchased outright the Diamond Rubber Co., and the J. I. Case Threshing Machine Co. both have made formal application for a listing of their shares on the New York Stock Exchange. The Goodrich company asks that $30,000,000 in preferred stock and $60,000,000 in common stock be admitted, and the Case company has made application for the admission of $11,289,500 in preferred trust stock certificates and $6,686,500 in common stock trust certificates.

Dayton Company Sues New York Dealer.

Supplementing the troubles of George Wishart and the Wishart Dayton Auto Truck Co., of New York City, against the latter of which a petition in bankruptcy has been filed, the first steps in an action against both were taken on Saturday last, 10th inst., when the Dayton Auto Truck Co., of Dayton, O., filed a praecipe in United States Court for the Southern District of New York. Although the matter is said to hinge upon the sale of three Dayton trucks and to be for goods sold and delivered, no bill of complaint has been filed and the summons has not been served. A hearing in the bankruptcy matter is scheduled for to-morrow afternoon, 16th inst.

Oakland Opens Branch in Cleveland.

The arrangement whereby Oakland cars were distributed in the state of Ohio by the Olds-Oakland Co., of Cleveland, which formerly acted as agent for both Oakland and Oldsmobile cars, has been terminated, the Oakland Motor Car Co., of Pontiac, Mich., having established a factory branch in the Ohio city. Fred C. Wood, who, prior to his affiliation with the Oakland factory, was manager of the Olds-Oakland company, is in charge of the new branch, which is located in temporary quarters on Euclid avenue, at East 20th street.

Pacific Coast Moline Company is Formed.

The Moline Automobile Co., of the Illinois city for which it is named, has established a branch in Los Angeles, Cal., which will be incorporated as the Moline Automobile Co. of Los Angeles. O. J. Root will have charge of the company's Western business. Already arrangements have been made with the Ben-Rick Auto Co., of Los Angeles, to handle the retail trade in that city and immediate vicinity. Eventually a number of other retail dealers will be established at various points in the Pacific Coast states.

Flint Factory for Marvel Carburetters.

The Marvel Carburetter Co., which heretofore has manufactured Marvel carburetters in Indianapolis, Ind., is preparing to remove bodily to Flint, Mich. A three-story factory building, 50 x 150 feet, on Mill street, has been acquired and the operation of moving the machinery and stock of the company will be completed in time to permit manufacturing to be commenced in the new plant by September 1st. A. G. Schonacker, who is general manager of the company, will remain in charge.

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GOODYEAR FIGURES SHOW STRENGTH

Statement of Company's Finances Points to Good Value in Stock Issue—Double the Earnings Likely this Year.

To provide increased working capital, the Goodyear Tire & Rubber Co., of Akron, O., has issued $5,000,000 of 7 per cent. cumulative preferred stock in connection with which Spencer Trask & Co., of New York City, who have purchased $1,600,000 worth of the securities, have issued a statement of the Goodyear company's affairs which indicates the high earning power of the rubber manufacturing company's business. Aside from the rapidly increasing earnings, strength is added to the offering by the statement that the patents, trade marks and designs of the concern are capitalized at the nominal figure of one dollar; and whereas these items and good will, which are recognizably valuable in connection with the Goodyear business, are often made the basis of a considerable capitalization, the Goodyear company chooses to place a valuation only upon actual assets; good will is not capitalized at all.

The earnings of the company are interesting in the light of their large increases, the figures, respectively, for the years 1908-9, 1909-10, 1910-11 and 1911-12 being $4,277,067.06, $9,560,144.92, $13,262,265.63, and $25,029,162.71, the last four months in the last year, which are July, August, September and October, being estimated. Of the $5,000,000 issue, $1,000,000 was issued to retire a like amount of old preferred stock. The statement follows:

ASSETS

Fixed:		
Real Estate and Buildings	$1,735,981.68	
Machinery and Equipment	1,401,213.64	
Furniture, etc.	210,790.08	
		$3,347,985.40
Current:		
Inventory	$4,566,902.65	
Cash	546,344.80	
Bills and Accounts Receivable	3,779,848.62	
Notes Receivable from officers and employes, secured by stock	163,078.64	
Prepaid Accounts	252,807.26	
		$9,308,981.97
Other Assets:		
Securities Owned	$167,937.74	
Suspense Accounts	50,763.40	
Patents, Trade Marks and Designs	1.00	
		$218,702.14
Total Assets		$12,875,669.51

LIABILITIES

Current:		
Bills and Accounts Payable		$1,842,723.65
Reserves:		
For Crude Rubber	$250,000.00	
For Doubtful Accounts	185,014.47	
For Legal Suspense	108,865.62	
For Depreciation Plant	456,422.10	
		$1,000,302.19
Fixed:		
Preferred Stock	$5,000,000.00	
Common	5,000,000.00	
		$10,000,000.00
Total		$12,843.025.84
Surplus		32,643.67
Total Liabilities		$12,875,669.51

Leeches to Make Engines in Lima.

The Leech Automobile Co., of Lima, O., which has been incorporated under the laws of that state with $100,000 capital stock, has elected the following officers: Charles M. Leech, president; H. H. Hughes, vice-president; Frank M. Leech, secretary; A. M. Kelchner, treasurer; H. W. Allen, manager. Other men interested in the company include Frank Colucci, Arthur Thomas, Ivan L. Eastman, J. W. Rumble and Howard Allen. The immediate purpose of the company is to manufacture an engine invented by the Leeches, but ultimately it is probable that an engine starter, a transmission system, a carburetter and a shock absorber, on which the Leeches have patents, will be produced.

Durant Acquires Imperial Wheel Works.

W. C. Durant, whose most recent venture, the $65,000,000 Republic Motors Co., of Delaware, which was incorporated to exploit his newest products, the Little and Chevrolet cars, and which has served to bring him once more into the limelight, has acquired possession of the Imperial Wheel Works, of Flint, Mich., and a plot of ground which adjoins that factory. As Durant has been a stockholder in the Imperial Wheel Works for some time, if not the principal one, he will not be entirely new to that branch of his immense business. It is expected that possession of the new plant will be taken about September 1st .

Russian Tire Firm Considers Dissolution.

The interests in the Russian Tyre Co., of 891 Eighth avenue, New York City, which has the agency for the Prowodnik tire, a Russian product, having been purchased by Otto Braunwarth and incorporated in the Russian Tyre Sales Co., the first named concern is to hold a meeting in the new company's offices August 26, to consider dissolving. Associated with Braunwarth in the new company, which was incorporated in July, is H. Ray Paige, who is president and treasurer, Braunwarth being vice-president and secretary.

Republic Tire Sues Alleged Infringer.

Alleging that the G. & J. Tire Co., a New Jersey corporation having an office in Indianapolis, has infringed patents for certain improvements in tires, the Republic Tire & Rubber Co., of Youngstown, O., this week filed suit against the New Jersey company in the United States District Court in Indianapolis. The patents in question were granted in 1908 to Tod J. Mell of Youngstown and are controlled by the Republic company. An accounting and injunction are asked.

Matrix to Make Motor Cars in Joliet.

The Matrix Automobile Co. has been organized in Joliet, Ill., and purposes engaging in the manufacture of motor cars. Earl D. Fuller and W. O. Dayton, both of Joliet, and J. T. Wilcox, of Fairbury, Ill., are the moving spirits in the enterprise.

HAVERS-BOTTO TANGLE THICKENS

Receiver Appointed for Company Claiming to be Rightful New York Dealer—Botto Appears in a Third Venture.

Another chapter was added to the somewhat involved history of the Havers dealership in New York City and William M. Botto's connection therewith when this week a receiver was appointed in the New York City Court for the Havers-Imperial Auto Sales Co., which claimed, and still claims, to be the rightful Havers dealer; about the same time Botto, who within a few months has been connected with three different dealership concerns, one of them a rival Havers dealership, appeared as an incorporator of the Regal Auto Sales Co., of New York City. By reason of Botto's "flittings," interest in his moves scarcely is overshadowed by the interest in Havers matters. His latest venture is about to be established in salesrooms on Broadway.

Botto, who has been connected with New York City's automobile affairs for some time, first appeared in the limelight after the Havers-Imperial company was formed in February of this year, Fred C. Robie, the president and treasurer of the concern, testifying in supplementary proceedings following a judgment for $405.52 against the firm by Frank Kiernan, an advertising man, that Botto agreed to get a Havers dealership contract for the company, but that when such was secured he took it from the office mail box and forthwith formed the Knickerbocker Motor Car Sales Co. Associated with him, among others, was Edward F. Rush, a theatrical man. Thereupon the Havers-Imperial company instituted an action in the Supreme Court for New York county demanding the return of the contract and an accounting of profits earned by the Knickerbocker company; the Havers Motor Car Co. of Port Huron, Mich., was made a defendant in the action. Efforts were made to rush the matter through, as the contract in question expires August 31st, next, but progress has been slow, and meantime the Havers-Imperial, having nothing else in particular to do, has gone out of business; hence the judgment and receivership.

Meantime Botto and the Knickerbocker company opened a commodious establishment at Broadway and West 50th street. Later the company moved to 1655 Broadway, when their first location was taken by a theater, and inquiries there were productive of the information that both Botto and Rush are no longer with the firm; C. M. Pope, a moving spirit in the Knickerbocker company, states he cannot say who will handle the Havers after August 31, though he did say that rumors of a factory branch were unfounded.

Botto's new venture, the Regal Auto Sales Co., led to inquiries at 1670 Broad-

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way, where the Regal and Abbott-Detroit have been handled by the Regal Sales Co. of New York and the Abbott-Detroit Motor Co. of New York, and it was said that when the Regal contract terminated August 1 it was not renewed, hence Botto's new line. Whereas he had with him in the Knickerbocker company one theatrical man, he now has two—Max Hart and Norman E. Manwarring, both theatrical promoters, of 1495 Broadway. The capitalization is $5,000. Meanwhile the Havers-Imperial company, not having forgotten its dealings with Botto in the Knickerbocker transaction, declares its claim against him is valid and cites it as its only asset. Robie stated in his testimony that the Havers-Imperial debts were $3,400, but that if the claim against Botto could be collected all the creditors could be satisfied, but the tangle of finances and litigation throws such a veil of uncertainty about the claim that it can hardly be regarded as a tangible asset.

Jenkins Company Quits Business.

The Jenkins Motor Car Co., of Rochester, N. Y., which manufactured automobiles on a small scale, has discontinued business, its plant having been acquired by a new company, the Shafer-Decker Co., which will handle the Cole car in that city. Fred J. Decker, former chief engineer for the Jenkins company, is a member of the new concern.

Poss Establishes Cleveland Agency.

The Park Motor Mfg. Co., which conducts a general automobile business at 10,215 Superior avenue, Cleveland, O., has taken the agency for that city for the Poss light delivery wagons. W. A. Snyder, who is at the head of the selling organization of the Park company, has the distribution of the trucks under his direct supervision.

Motz Establishes Pittsburgh Branch.

Extending its chain of factory branches, the Motz Tire & Rubber Co., of Akron, O., just has opened another branch, this time in Pittsburgh, Pa. It is located at 300 North Craig street, and will be in charge of S. H. Frensdorf, who formerly was associated with the Boston branch of the Diamond Rubber Co.

Ford Takes Over a Banking Business.

Henry Ford, the Detroit manufacturer, now owns a bank of his own. He has acquired the D. P. Lapham Savings Bank, in Dearborn, Mich., which he will continue to operate as the Bank of Dearborn. The bank has a capital of $25,000 and a reserve fund of $20,000.

May Manufacture Wagons in New Orleans.

The Automobile Maintenance Co. has been organized in New Orleans, La., with J. Rayaud as president. Its immediate purpose is the maintenance of all manner of motor vehicles, but it is possible that later the manufacture of motor wagons will be taken up.

PATENTS THAT EXPIRE THIS YEAR

American Diesel Patent Nearing End of Term—Other Well-Known Devices That Soon Will Be Public Property.

Although large numbers of patents expire annually, it is seldom that a year sees the flickering out of as many patents bearing directly upon the motor car industry as will the current twelvemonth. Prominent among those that are passing is patent No. 542,846, issued in the United States to Rudolph Diesel, July 16, 1895, and which will become void on July 16th next. Whether this will have any particular effect on the development of the Diesel type of motor in this country remains to be seen.

Another basic patent which, however, is more closely linked with automobile design than is the Diesel patent, will expire June 11th coming, having been issued to Charles E. Duryea, of Peoria, Ill., on that date in the year 1895. Among other things which are set forth in the very lengthy paper describing the invention, and which are reiterated among the numerous claims, are the inclination of the pivots on which the stub ends of the front or steering axle turn, so that their axes prolonged meet the earth at the base of the wheel, and the design of a change gear mechanism in which the gears are constantly in mesh, the manipulation being accomplished by means of individual clutches which fasten the proper wheels to the revolving shafts. Pivotal steering, which results from the inclination of the steering stub pivots, is not very popular with motor car designers at the present date, because of complications which arise and which tend to weaken the steering gear as a whole, but modifications of Duryea's change gear mechanism are quite common, especially in the heavier sets which are applied on motor trucks.

E. N. Dickerson, of New York City, and J. J. Suckert, of Jersey City, N. J., patented, March 19th, 1895, a process for the manufacture and liquefaction of acetylene gas, the product being introduced into steel tanks for transportation. Liquefaction is not indulged in to any great extent at the present time, the more simple method of dissolving the gas in acetone and packing the transporting tank with asbestos or silk wool having supplanted the older method, but the process of manufacture and of purifying and drying described in the patent are similar to those which are adhered to at the present time.

Two really important patents, Nos. 544,626 and No. 544,627, which have to do with the manufacture of inner tubes for pneumatic tires, were granted to F. W. Morgan, Chicago, Ill., during 1895, and will expire on August 13th of this year. In both are described methods of building up tubes from crude rubber, a mandrel and a special table being employed, with the ultimate aim of producing a seamless flexible inner tube after vulcanization.

Two odometer or "cyclometer" patents expire during 1912, the first patent, No. 537,824, to W. W. Hastings, of Jersey City, N. J., in which the indicating dials are caused to move in the proper relation with each other by virtue of the action of several ten-toothed wheels which are operated through the intermediary of pins which connect with the teeth at the proper time. The second "cyclometer" patent was issued to Curtis H. Veeder, Hartford, Conn., October 22nd, 1895, and covers odometers of the class where the indicating figures are placed on the periphery of several revolving cylinders, motion being imparted to the cylinders through a special differential gearing and a series of star wheels.

President Donaldson Passes Away.

After an eventful career, during the latter part of which he had become universally well known and well liked by the great majority of those connected with the automobile industry, Henry F. Donaldson, who for the past year has been president of the Society of Automobile Engineers, passed away suddenly at his home, 508 West 139th street, New York City, the early part of the present week. Exactly when he died and the cause of his demise are not known, though it is rumored that he committed suicide. Prior to his affiliation with the S. A. E., Donaldson became well known to the trade as a consulting engineer of recognized ability. Latterly, he became associated with Joseph Tracy and maintained offices in the United State Rubber Building in New York, where for the better part of the past year a general consulting business has been carried on.

To Build Goodyear Branch in Toledo.

The Goodyear Tire and Rubber Co., of Akron, Ohio, has executed a lease for a building which will be erected for its use at 909 Jefferson avenue, Toledo, and which will be operated as a factory branch. The building, which will be a three-story pressed brick structure, 30x100 feet, will be ready for occupancy about November 1st.

Sudrow Now Sales Manager for Marion.

Completing the organization of the Marion Motor Car Co., of Indianapolis, Ind., which is headed by J. I. Handley, F. G. W. Sudrow has been appointed sales manager. For the past year Sudrow has been sales manager for the Apple Electric Co., of Dayton, O. Formerly he was head of the purchasing department of the north plant of the Dayton Motor Car Co.

Oakland Opens Own Branch in Detroit.

The Oakland Motor Car Co., of Pontiac, Mich., has taken over the sale of its own cars in Detroit and established a factory branch at 1237-41 Woodward avenue. It is in charge of William R. Tracy, who previously was sales manager of the Oakland Sales Co., Ltd.

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THE WEEK'S INCORPORATIONS




Detroit, Mich. — Bemb-Robinson Co., under Michigan laws, with $15,000 capital; to deal in motor cars.

Baltimore, Md.—Baltimore Motordrome Co., under Delaware laws, with $75,000 capital; to operate a motordrome.

Detroit, Mich.—Durable Top Specialty Co., under Michigan laws, with $15,000 capital; to manufacture motor car tops.

W. Brown, Mark F. Brown, T. C. McMillan.

Ft. Wayne, Ind.—Kilbourne-Thompson Co., under Indiana laws, with $50,000 capital; to deal in motor cars. Corporators—E. H. Kilbourne, F. B. Thompson, F. R. Dulin.

Geneva, N. Y.—D. M. Dorman Co., under New York laws, with $10,000 capital; to deal in motor cars. Corporators—Otto S. Heberling, William A. Curtis, George R. Durgan.

St. Joseph, Mo.—Northwest Auto Co., under Missouri laws, with $5,000 capital; to deal in motor cars. Corporators—Ben F. Ellington, Claud C. Tanner, Lena M. Ellington.

Dixonville, Pa. — Auto Transportation

RECENTLY ACQUIRED PLANT OF THE STEWART MOTOR CORPORATION IN BUFFALO, N. Y.



The factory building, which is of modern design and construction, will be devoted exclusively to the production of light delivery motor cars. It is located at the intersection of Randall and Superior streets

Flint, Mich.—Randolph Motor Truck Co., under Michigan laws, with $200,000 capital; to manufacture and deal in motor trucks.

Los Angeles, Cal.—English Motor Car Co., under California laws, with $50,000 capital; to deal in motor cars. Corporators—P. A. English, C. A. English.

Newport, Ind.—Newport Motor Club, under Indiana laws; to conduct a social organization. Corporators — L. M. Casebeer, J. B. Groves, James Barker.

Milwaukee, Wis.—George W. Brown, under Wisconsin laws, with $5,000 capital; to deal in motor cars. Corporators—Geo.

deal in motor cars. Corporators—D. M. Dorman, Charles C. Runyan, Louis J. Licht.

Tacoma, Wash.—Union Motor Car Co., under Washington laws, with $10,000 capital; to deal in motor cars. Corporators—R. A. McCormack, W. L. McCormack and others.

Buffalo, N. Y.—Gardner-Hotte Sales Co., under New York laws, with $10,000 capital; to deal in motor cars. Corporators—John J. Gardner, George Hotte, William E. Hotte.

Chicago, Ill.—Modoc Motor Car Co., under Illinois laws, with $2,500 capital; to

Co., under Pennsylvania laws, with $85,000 capital; to operate a motor delivery. Corporators—W. C. Carr, G. W. Carr, J. H. Prescott.

Milwaukee, Wis. — Overland Wisconsin Co., under Wisconsin laws, with $50,000 capital; to deal in motor cars. Corporators—George W. Brown, Mark F. Brown, T. C. McMillan.

Cincinnati, Ohio—No-Shammy Funnel Co., under Ohio laws, with $1,000 capital; to manufacture motor car devices. Corporators—F. T. Kovar, George Dautel, David P. Bowden.

Cedarburg, Wis.—A. J. Meyer Motor Car

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Co., under Wisconsin laws, with $25,000 capital; to deal in motor cars. Corporators—John Armbruster, Jacob Dietrich, John F. Bruss.

St. Louis, Mo.—Todd's Auto and Rental Co., under Missouri laws, with $2,000 capital; to deal in motor cars. Corporators—Edward S. Todd, William A. Todd, jr., Otto Glasmeyer.

Kansas City, Mo.—Kansas City Automobile Co., under Missouri laws, with $5,000 capital; to deal in motor cars. Corporators—Albert Morris, Harry Stevenson, Samuel Benjamin.

Chicago, Ill.—Tesla Auto Light Co., under Illinois laws, with $6,000 capital; to manufacture motor car devices. Corporators—Charles B. Stafford, Harry C. Lovinson, Albert Jacobs.

Indianapolis, Ind.—A. & M. Sales Co., under Indiana laws, with $2,000 capital; to deal in motor cars. Corporators—J. I. Handley, T. L. Marshall, L. R. Wilbur, C. C. Perrin, F. C. Sudrow.

South Bend, Ind.—South Bend Auto Body Co., under Indiana laws, with $20,000 capital; to manufacture automobile parts and bodies. Corporators—S. W. Nicholson, J. C. Paxon, V. E. Paxon.

Detroit, Mich.—T. C. Radiator Co., under Michigan laws, with $2,000 capital; to manufacture and deal in motor car accessories. Corporators—Thomas Coffelder, A. E. Sherman, C. V. Jones.

New York, N. Y.—Regal Auto Sales Co., under New York laws, with $5,000 capital; to deal in motor cars. Corporators—Max Hart, William M. Botto, Norman E. Mannwarring, all of 1495 Broadway.

Pittsburgh, Pa.—Gardner Garage & Supply Co., under Pennsylvania laws, with $5,000 capital; to operate a garage and deal in motor car supplies. Corporators—W. M. Hall, G. W. Kilpatrick, J. C. Billy.

New York, N. Y.—Electric Spark Appliance Co., under New York laws, with $5,000 capital; to manufacture motor car devices. Corporators—Michael M. Lint, Peter Ross, Alexander Miller, all of 5 Beekman street.

New York, N. Y.—Holt-Chandler Co., under New York laws, with $25,000 capital; to deal in motor cars. Corporators—Henry E. Holt, Frederick E. Tucker, 1930 Broadway; Warren R. Chandler, 1932 Broadway.

Youngstown, Ohio—Folberth Carburetter Co., under Ohio laws, with $70,000 capital; to manufacture motor car accessories. Corporators—E. A. Hegg, N. A. Emery, E. A. Tobey, Joseph F. Williams, Thomas L. Morgan.

Toledo, Ohio—W. H. McIntyre Co., under Ohio laws, with $10,000 capital; to deal in motor cars and accessories. Corporators—W. H. McIntyre, C. McIntyre, William G. Volkmayer, L. Lackey, Frank G. Kelley.

New York, N. Y.—Curran Patent Co., under New York laws, with $10,000 capital; to manufacture motor car devices. Corporators—Harry L. Curran, Clara D. Curran, Coney Island; Charles H. Wilson, 2 Rector street.

Buffalo, N. Y.—Studebaker Sales Co. of Buffalo, under New York laws, with $25,000 capital; to deal in motor cars. Corporators—Arthur W. Haile, 1015 Main street; Bradley H. Phillips, E. C. Schenckler, Morgan Building.

Cleveland, Ohio—Mutual Oil & Auto Supply Co., under Ohio laws, with $10,000 capital; to deal in lubricants and motor car accessories. Corporators—H. L. Stouer, H. C. Killiman, Herbert House, C. F. Franke, A. S. Krause.

New York, N. Y.—Newmastic Co., under New York laws, with $250,000 capital; to deal in motor car tires. Corporators—Orrel A. Parker, 225 West End avenue; Robert Weld, 625 West 156th street; Oliver H. Bartine, 135 East 42d street.

Brooklyn, N. Y.—Chinnock Garage, Inc., under New York laws, with $3,000 capital; to operate a garage. Corporators—Beatrice H. Mattoon, 442 Halsey street; Adelaide Kenny, 376 3rd street; Edgar L. Chinnock, Jr., 1108 Bedford avenue.

New York, N. Y.—Herman-Yount Co., under New York laws, with $100,500 capital; to deal in motor cars. Corporators—Daniel H. Hanckel, 19 7th avenue, Brooklyn; Frederick B. Hunt, 42 Broadway; Helen M. Kelly, 1309 Hoe avenue.

New York, N. Y.—A. H. Kasner Tire Co., under New York laws, with $10,000 capital; to deal in motor car tires. Corporators—Alexander H. Kasner, Hattie Kasner, 869 Eastern Parkway, Brooklyn; Antonio Massari, 1379 67th street, Brooklyn.

New York, N. Y.—Duffy Lubricants Mfg. Co., under New York laws, with $25,000 capital; to manufacture lubricants. Corporators—James F. Duffy, 32 McComb Place; Henry W. Conklin, Morsemere, N. J.; Harris K. Halikman, 135 West 67th street.

New York, N. Y.—Rubberine Tire Filling & Sales Co., under New York laws, with $500,000 capital; to manufacture and deal in tire filler. Corporators—James D. Bridges, James Curtis Clarke, 233 West 50th street; George H. Davis, 146 East 32d street.

New York, N. Y.—Silvex Co., under New York laws, with $100,000 capital; to manufacture automobile polish and other accessories. Corporators—Edward E. Schwab, 44 Afterglow Way, Montclair, N. J.; James H. Ward, 485 8th street, Brooklyn; Charles M. Schwab, 21 Riverside Drive.

Richmond Hill, N. Y.—Dillman-Helin Motor Co., under New York laws, with $20,000 capital; to deal in motor cars. Corporators—William C. Dillman, Richard A. Dillman, 39 Cherry street; E. W. Helin, 268 Washington street, Jamaica, L. I.; Fred G. Hoerlein, 1004 Broadway, Brooklyn.

New York, N. Y.—Cukor Safety Crank Co., under New York laws, with $40,000 capital; to manufacture motor car devices. Corporators—Bela Cukor, 65 St. Andrews Place, Yonkers; Isadore Neustaeder, 71 7th street, Brooklyn; Hyman J. Rosenblum, 215 Bay 15th street, Bath Beach.

Middletown, N. Y.—Industrial Motor Car Co., under New York laws, with $350,000 capital; to manufacture and deal in motor cars. Corporators—William A. Courtland, Cuthbert W. Jewell, M. G. Crawford, 2 Rector street, New York City; Harris H. Rayl, Wheelock Mansions, 156th street and Hudson River; Montecello A. Bonneford, 65 Central Park West, New York City.

Legal Tangle Over Protested Note.

Had not the attorneys for Bertram Bernnard themselves erred in legal technicality, their plea of error on the part of the attorneys for the United States Motor Co. might have availed in the New York City Court on Friday of last week, 9th inst., and Bernnard, who is the proprietor of a collection agency, might have secured judgment for $1,011.27, which he asks in an action he has instituted against the corporation. As it is, judgment is likely to be decided upon the merits of the case at some future date. Bernnard's attorneys pleaded that the United States Motor's answer, when served, was unaccompanied by a court order directing trial and that under Section 1,778 of the Code of Civil Procedure the defense thereby defaulted. The judge ruled, however, that to obtain the benefits of the section in question the plaintiff should have returned the answer to the defendant when it was served.

The action is based on a 60-days note for $1,010 given, it is claimed, April 25 by the United States Motor Co. to the Ditzler Color Co., of Detroit, a paint manufacturer, and which thereafter was endorsed and passed on to Adolph M. Schwarz, an attorney, of 299 Broadway, New York City, who presented the note for payment at the American Exchange National Bank, where it went to protest. Schwarz later assigned his claim to Bernnard, whose office is in the same building as the attorney's, and suit is brought in Bernnard's name by Schwarz. Added to the $1,010 is the protest fee of $1.27, which it was necessary for the holder of the note to pay when funds were not realized at the bank on the paper.

"Watching" Weaver Proves Pleasing.

Before he formally relinquished his desk at the factory of the Peerless Motor Car Co., of Cleveland, O., where for eleven years he had served the company in various capacities and latterly as office manager and assistant treasurer, Frank G. Weaver, who resigned to enter the rubber industry, was well remembered. He was presented with a gold watch and chain, a gold cigar cutter and several other gold articles, in addition to a leather covered Morris chair. Weaver left the Peerless company on August 8th and immediately will enter upon his new duties.

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Peter Apland plans to establish a garage in Story City, Ia.

W. Henderson has opened a garage in Paso Robles, Cal.

E. R. Parker has opened a garage in Hood River, Ore.

Carl W. Eckman has established a garage in Mankato, Minn.

Hans Byggere has purchased the Snyder Garage in Royal, Ia.

Matthew Noehl has entered the garage field in Watkins, Minn.

E. R. S. Auto Co. is the style of a new business in Brainerd, Minn.

Palmer & Gilley of Parkersburg, Ia., have sold their garage to H. Builthuis.

C. S. Miller has opened a garage in Woodstock, Minn. It will be managed by Clarence Rokes.

William Sheridan, of Concordia, Kan., has sold his garage to Otto Wilcox; the latter handles the Ford car.

Adolph E. Wenberg has bought the interest of E. A. Cooper in the Cooper & Clute Garage in Dunnell, Minn.

Selley Bros., of Albany, N. Y., have purchased a site at Broadway and Ferry street and will build a garage thereon.

C. T. Silver, New York distributer of Overland cars, has opened a sales and service branch in Asbury Park, N. J.

F. B. Breyfogle, Sr., has been granted authority to erect a garage at 1600 2d street, Louisville Ky. It will cost $6,000.

Kumkel Bros. of Chicago, have secured plans for a garage to be erected on West Madison street; it will cost $5,500.

J. Paul Ogle, has sold his interest in the Anaheim (Cal.) Motor Co.; he will return to his former home in Waterloo, Ia.

William J. Montgomery is securing estimates on a garage which he will have erected at 6129 Greene street, Philadelphia, Pa.

Jerome B. Hines, operator of a blacksmith shop in Chester, Pa., has commenced the erection of a garage adjoining his shop.

A one-story brick garage is to be erected at 494 Washington street, Newark, N. J., by William A. Hunt; its cost will be $3,000.

Permission has been granted to G. O. Nelson to build a brick garage on Asylum avenue, Knoxville, Tenn. He places the cost at $11,000.

Earl Bodenhammer has purchased a part interest in the Reed & Reid Garage in Louisburg, Kan. He will assume active charge of it.

Stroh & Calhoun is the style of a new firm which has leased the premises at 3829 Bell avenue, St. Louis, Mo., and will conduct a sales and repair business; another building may be added to the present structure.

A. D. Lawrence of Saxman, Kan., has bought the garage and machine shop of the Sterling (Kan.) Auto Co. He will continue the business.

C. C. Mish, manager of the Park Hotel, Williamsport, Pa., has secured plans for a concrete garage; it will represent an expenditure of $5,000.

A. C. Ware has purchased an interest in the Johnson & Dehart automobile business in Oakland, Ia. He will take an active part in the firm's affairs.

Setzer & Beach, Cole dealers in Bridgeport, Conn., have dissolved partnership. Bernard Setzer will continue the business at 361 Fairfield avenue.

Marathon Motor Sales Co. is the style of a new concern which has organized and located on Morton street, Baltimore, Md. It has the Marathon agency.

Harvey R. Smith, who has been a partner with C. C. Franklin in the Fillmore (Cal.) Garage, has purchased Franklin's interest; he will continue the business alone.

Anton Anderson of Denver, Col., has secured a permit to build a one-story brick garage at Albion street and 17th avenue; the plans call for an expenditure of $2,000.

Bids have been asked on a two-story brick and concrete garage to be erected in Long Beach, Cal., for the Co-operative Motor Co.; the estimated cost is $100,000.

Joseph H. Graves, manager of the Castle Inn, at Delaware Water Gap, Pa., has opened a garage in Stroudsburg, in the same state; Castle Garage is the style of the business

Richard C. Plater of Nashville, Tenn., has purchased a site at Broadway and Vauxhall street on which he will build a garage; he states it will be the largest in Tennessee.

John C. Bellhoff has had plans prepared and has secured a building permit for a garage to be erected on Albany street, New Brunswick, N. J. It will represent an expenditure of $1,200.

Headed by Clement Palin a new company is about to open up in Cohoes, N. Y., at Lancaster and Hart streets, under the style Congress Garage; William D. Bowdy will be manager.

M. Nabors and R. M. Northcutt, of Atlanta, Ga., have formed a co-partnership to handle Cole and Alco cars and Alco and Federal trucks; they will maintain salesrooms and a service department at 239 Peachtree street.

The Benjamin Eastwood Estate, of Paterson, N. J., has filed plans for a three-story machine shop and garage to be erected at 18-26 Rampo avenue; the structure will cost $35,000.

Clarence Robinson of Hiteman, Ia., and Charles Horn of Lovilia, in the same state, have formed a partnership to operate a garage; they will establish their business in Horn's home town.

Elhof & Tate have opened a garage in Ashland, Ky., under the style Park City Automobile Co. Their business, which will include a vulcanizing plant, is located on East Greenup avenue.

A. Baum of 316 East 67th street, New York City, is both owner and architect of a garage which he is about to build on 76th street, near Avenue A; the plans call for an expenditure of $10,000.

J. B. Pell, of Corcoran, Cal., with Webster Pell and W. W. Hathaway, formerly of Kansas City, Mo., is about to open a garage and machine shop in Corcoran; they will handle Ford cars also.

Under the style Hollywood Tire Repair and Auto Supply Co. a new concern has commenced business at 1638 Cahuenga avenue, in Hollywood, Cal. The company has the Ford agency for that vicinity.

Plans have been filed for a three-story brick garage, 50 x 95 feet, to be erected on West 100th street, near Central Park West, New York City, by Abe Bruder; the architects' estimate of cost is $7,000.

Detlow Marthinson and J. Perry Kinyoun of Washington, D. C., have formed the Federal Motor Co., with offices and salesroom at 1520 14th street, Northwest; they have the agency for Federal trucks.

J. Hallett of De Pere, Wis., and H. J. Malchow of the Auto Tire Repair Co., of Green Bay, in the same state, have taken on automobiles and will handle Paige-Detroit cars in Green Bay; they will locate at 517 Main street.

Lord & Read of Philadelphia, Pa., have secured authority to erect for Mary A. Read a two-story garage, 50 x 190 feet, at 3431-33 North Broad street; it will have individual stalls for 75 cars. The cost is estimated at $20,000.

Receivers have been appointed for W. Elkins Reed, a supply dealer at 1218 Connecticut avenue, Northwest, Washington, D. C. The petition in bankruptcy states that Reed's assets are about $1,500 and his liabilities about $6,500.

Kendall Automobile Co. is the style of a new agency which has opened up at 45 East Walnut street, Pasadena, Cal. A. C. Kendall is manager. The lines carried are the

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Columbus Electric, Firestone-Columbus and Warren Detroit.

Isaac C. Kirkman of Brooklyn, N. Y., has purchased a three-story brick building at 31-33 Grant square and will remodel it into an automobile sales establishment; the Eagle Savings & Loan Association was the owner of the property.

Roswell, N. M., is to become posesssed of a vulcanizing plant; E. J. Carrington of Roswell, in the same state, and L. R. Montgomery of St. Louis, Mo., will be the proprietors and will locate their business at 112 East Fourth street.

Marion and Roy Grigsby, of Macomb, Ill., have formed a partnership under the style Grigsby Bros., to sell automobiles; they will maintain headquarters in Blandinsville, in the same state, and will handle the Franklin and Regal cars.

Smith & Heberle, St. Paul (Minn.), distributers for the Hudson Motor Car Co., have taken over the Minneapolis agency also and will continue it at 907 Hennepin avenue; the Minneapolis Hudson Auto Sales Co. will enter the used car trade.

Theodore Riser, manager of the Anderson Automobile Co., of Lancaster, O., has resigned to enter business for himself; he has the Buick agency. H. E. Eyman, who recently purchased an interest in the Anderson company, has been made its manager.

The Cole Motor Car Co. has been organized in Omaha, Neb., to handle the car of that name. E. E. Butler, an experienced automobile man, is the moving spirit in the new enterprise, which temporarily is located at 1102-1104 Farman street.

W. A. Wicks, who recently left the engineering department of the H. H. Franklin Mfg. Co. to become that company's dealer in Seattle, Wash., has located his garage at 1109-1111 East Union street; he also has frontage at 1112-14 East Madison street.

W. A. Schumacker of the Norwood Machine Works just has completed a garage, at Pike and Madison streets, Norwood, O., at a cost of $16,000; there is storage space for 24 cars. The Norwood Motor Car Co., Ford distributer, will occupy a part of the building.

The Menhall Garage, at the rear of the Hotel Hilton, in Beloit, Wis., on August 1 passed into the hands of Drs. P. A. Fox, C. E. Smith and G. F. Beedle. James Menhall, the former owner, has become a traveling representative of the United States Motor Co. in Wisconsin.

A. M. Zerweck, who is the East St. Louis distributer for the products of the Warren Motor Car Co., of Detroit, has leased a plot of ground at 3048 Locust street, in St. Louis, and will erect upon it a one-story structure, 42 x 126 feet. Immediately the building is completed it will be occupied as a show and sales room for Warren cars.

The Anderson Electric Car Co., of Detroit, Mich., which has maintained a branch in St. Louis, Mo. has transferred its business to the Detroit Electric Car Co. of St. Louis, which has organized for the purpose; W. F. Sigmund, former branch manager, is president of the new concern. Salesrooms will be opened at Delmar boulevard and Clarendon avenue.

James N. Bussey, formerly secretary of the Gold Coin Stove Co., of Troy, N. Y., has formed a selling partnership with Daniel Conway, Jr., under the style J. N. Bussey & Co. The new firm will handle the R. C. H. car in four counties surrounding Troy in New York State; salesrooms have been secured at Hoosick street and Fifth avenue.

The Service Motor Car Co., which has operated automobile selling branches in Plainfield and Dunellen, N. J., for a year, has opened up in Newark, in the same state, with the Northern New Jersey agency for Henderson and Abbott-Detroit cars. Temporary quarters are at 228-30 Halsey street and are in charge of Forrest C. Stowers, formerly manager of the wholesale department of R. M. Owen & Co. in New Jersey.

Changes Among Prominent Tradesmen.

D. Marshank has been placed in charge of the Chicago sales department of the Mea Magneto company's branch in that city. His territory embraces the entire Middle West.

R. A. Whitehead has been appointed sales manager for the Church-Field Motor Co., of Sibley, Mich. Formerly he was a member of the Flanders electric sales department in Pontiac.

George H. Lloyd, who for the past four years has been sales manager for the Velie Motor Vehicle Co., of Moline, Ill., has resigned that position. His plans for the future are not yet perfected.

Carl Bernhardt has been appointed associate director of advertising for the Cole Motor Car Co., of Indianapolis. Previously he was identified with the Indianapolis Sun and the Richmond Palladium.

Frank S. Callandar has been made general manager of the sales department of the Acme Pattern Works of Detroit, Mich. For the past four years he has been connected with the engineering department of the Studebaker Corporation.

Albert D. Frost has been appointed sales manager of the Gramm Motor Truck Co., of New York. His previous experience includes service with the Harry S. Houpt Co., the Thomas Motor Car Co. of Boston and the American Locomotive Co.

W. D. Edenburn has resigned his position with the Remy Electric Co., of Anderson, Ind., to become affiliated with the recently formed Henderson Motor Car Co. of Indianapolis, Ind. He will devote his energies to the daily newspaper end of that company's advertising department.

Glibert C. Scofield has been appointed superintendent and mechanical engineer of the Hilliard Clutch & Machinery Co., of Elmira, N. Y. He succeeds William Hilliard, who resigned. Scofield has had varied experience, having at various times been connected with the Lozier, Franklin, Marmon, Parry, American and LaFrance companies.

J. F. Corl, former general manager of the Rapid Motor Vehicle Co., of Pontiac, Mich., has been appointed Western District manager of the General Motors Truck Co., of which the Rapid company is a subsidiary. He will make his headquarters in Chicago. Gleeson F. Murphy, vice-president and general manager of the General Motors Truck Co., will take over the factory duties previously performed by Corl.

F. E. McClure, formerly manager of the States Cleveland Motor Co., of Cleveland, O., distributers of Stoddard-Dayton, Courier and Sampson cars, has been appointed local manager of the United Motor Cleveland Co., which handles Maxwell and Columbia cars. He succeeds C. H. Taylor, who has resigned in order to become manager of the agency for the Marion Motor Car Co. of Indianapolis, Ind.

Russell Huff and C. J. Moore have been appointed consulting engineer and manufacturing engineer, respectively, for the Packard Motor Car Co., Detroit. They will have joint supervision of the three engineering divisions. J. T. Langhorne, who has been manager of the truck sales department, has resigned that position in order to enter a private business enterprise and has been succeeded by C. R. Norton.

A. L. Zeckendorf, who for the past three years has been local manager for the Oakland Sales Co., of Detroit, and whose previous experience embraces service with the Packard company, has become the Michigan distributer for the products of the Cole Motor Car Co., of Indianapolis. Associated with Zeckendorf is Eugene Siegel, the firm name under which business will be carried on being Siegel-Zackendorf Co. A salesroom has been opened at 806 Woodward avenue, and it is supplemented by a modern service department.

Changes in Capitalization and Name.

Toledo, Ohio—Kinsey Mfg. Co. from $1,000,000 to $3,000,000.

Toledo, Ohio—Willys-Overland Co. from $6,000,000 to $16,000,000.

Indianapolis, Ind.—Cole Motor Car Co. from $300,000 to $500,000.

Ashland, Ohio—Faultless Rubber Co. from $325,000 to $1,000,000.

Cleveland, Ohio—Cleveland Auto Starter Co. from $25,000 to $50,000.

Des Moines, Ia.—Pitts-Matthews Carriage and Auto Co. to Matthews Carriage and Auto Co.

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THE MOTOR WORLD

PUBLISHED EVERY THURSDAY BY

The Motor World Publishing Company

1600 BROADWAY, NEW YORK, N. Y.

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Subscription, Per Annum (Postage Paid) $2.00
Single Copies (Postage Paid) . . . . . 10 Cents
Foreign and Canadian Subscriptions $3.00
Invariably in Advance.

Postage Stamps will be accepted in payment for subscriptions. Checks, Drafts and Money Orders should be made payable to The Motor World Publishing Co.

☞Change of advertisements is not guaranteed unless copy therefor is in hand on SATURDAY preceding the date of publication.

Contributions concerning any subject of automobile interest are invited and, if acceptable, will be paid for; or, if unavailable, will be returned provided they are accompanied by return postage.

Cable Address, "MOTORWORLD," NEW YORK.

Entered as second-class matter at the New York Post Office, November, 1900.

NEW YORK, AUGUST 15, 1912

ONE WAY TO ELIMINATE THE GEARSET.

Much may be said in favor of the four-speed gearset that is so popular abroad in cars fitted with small motors, and which is becoming more popular in America. When everything has been said, however, the sum total of it all is that the most conspicuous virtue of the change-speed gear—a virtue born of absolute necessity—is its ability to cover up the deficiencies of the gasolene motor and produce an effect of flexibility in the operation of the car that is not obtainable otherwise. Good as the modern gasolene motor is, it is far from being a truly flexible prime mover, for, while it can be run at almost any speed, the power output varies with the speed, in which respect it is distinctly inferior to the steam engine and the electric motor.

To deliver any considerable power at low speed a gasolene motor must be made so large that the power developed at normal speeds will be out of proportion to the requirements of an ordinary car; nevertheless, such a motor is the only alternative if the gearset is to be eliminated, and as it is impracticable for motor car work, gears become necessary. The smaller the motor the more speed changes must be provided for, and thus it comes to pass, in the opinion of many eminent engineers, that in order to use a motor of the most economical size for average work, four speeds are necessary. But though gears are comparatively quiet now to what they were a short time ago, they still are noisy to an extent that is emphasized by the extreme quietness of other parts of the high-class car, and, while the average American builder chooses a big motor and few gears, notwithstanding relatively high fuel consumption, rather than a small motor and many gears, his position is fast becoming uncomfortable, with a possibility of its becoming untenable, owing to the fact that the price of fuel is rising, and the high limit is as yet undiscernible.

Human nature is prone to follow the path of least resistance. It may well be, however, that in the not far distant future the path of least resistance in this matter will pass between the two horns of the dilemma, so to speak—that is to say, it will be a step forward to produce a gasolene motor possessing the kind of flexibility that is characteristic of the electric motor and the steam engine. There is no gainsaying the fact that the attainment of such a result must entail the employment of the highest order of engineering ability; but that it cannot be done is unbelievable. The obvious objection to the argument that it is possible to produce a motor capable of delivering high power at low speeds is that in the present type of motor the power output is governed by the number of explosions occurring in a given time. Equally obvious is the fact that means must be devised for increasing and regulating the energy of the individual explosions—just how remains to be seen. Radical as this may seem, it appears to be the only way to avoid the use of an unduly large motor on one hand, or of an "unmechanical" set of gears on the other.

BENEFITS FROM AN UNEXPECTED SOURCE!

According to the proverb—and who would be so disrespectful as to question the truth of an ancient saying?—every cloud has a silver lining. It is by no means impossible that there may be an interior sheathing of the precious metal in the dense bank of vapor that represents the increased and increasing price of gasolene, for it is a fact that carburetter economy is being studied as it never was studied before, and even if the theoretically correct, or ideal, carburetter is not evolved as a result of the Standard Oil company's urgent need of funds, which hardly is to be expected, still the effect on carburetters in general cannot but be beneficial. Incidentally, those who use them undoubtedly will become more familiar with their peculiarities and with the methods by which they may be coaxed to do their best in easing the strain on car owners' pockets. Add to this, augmented skill in driving and the very possible improvements in motors with a view to economy, and there appears to be sufficient material for quite a respectable silver lining. Nevertheless, it is exceedingly dubious, even if all these good things result, if the beneficiaries will take the trouble to thank the benevolent purveyors of petroleum products for furnishing the stimulus.

TRUCK DATA THAT IS NEEDED.

However well a motor truck may be designed, and however excellent may be the materials and the workmanship employed in its construction, no one machine is equally good for all classes of service; there must be some kinds of work in which certain trucks will perform more satisfactorily than others. From which it appears that there is real need for authentic information as to the classes of service for which cars of given types are best adapted; such data would benefit the buyer because he would know what class of machine would best fill his wants, and the builder because he would know what types of cars his line needed to fill the requirements of different classes of users.

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KNIGHT LOSES IN BRITISH COURT

Argyll Sleeve-Valve Engine Held Not To Infringe—Court Denies Claim to Master Patent.

Placing at least a semicolon to the litigation which was commenced last November by the Knight & Kilbourne Patents Co., which, immediately after the appearance of the Argyll sleeve valve engine at the Olympia exhibition in London, commenced suit against Argylls, Ltd., of Edinburgh, Scotland, for alleged infringement of the Knight patents, Justice Neville in No. 3 Chancery Court has rendered decision in favor of the Argyll company. Though the case, which has been dragging on for nearly a year, thus is disposed of for the present, there is no indication that the last has been heard of it, for the Knight and Kilbourne company has indicated that an appeal will be taken, and it is altogether likely that battle will be as long drawn out and as interesting as appeared at first.

In handing down the decision, it is held that Argylls, Ltd., does not infringe the Knight patent—which is what the defendant sought to prove. The patent over which the litigation occurred, however, is not the one under which the present Knight engines are constructed, as generally may be supposed. Instead, it is a much earlier patent which is claimed to be basic and which was issued in 1905, bearing the number 14,729. The later patent, which is not in any way affected by the judgment, was issued in 1908 and is numbered 12,355.

The construction of the two engines described in the patents differs materially, and it was on this point that the greater part of the argument rested, it being held by Argylls, Ltd., that the patent under discussion covered a mechanism which as an engine was a hopeless failure inasmuch as the arrangement of the valves was such as to preclude the possibility of the engine ever running under its own power. In explanation of this discrepancy, the Knight and Kilbourne company pointed out in the testimony that was taken that the patent specifications were not intended as working drawings and that the alterations necessary in order to make the engine function properly were of such character as to be readily distinguishable by the average mechanic. In reviewing the case, however, the court held otherwise and, though admitting that the question was a minor one at the time, pointed out that "it is always easy to guess a riddle when you have been told the answer." In rendering decision the court said:

"To claim for the patent for this invention the title of a master patent is, I think, extravagant. Dawson and King had solved the problem of the application of sliding valves to a four-cycle engine unsatisfactorily. The plaintiffs' patent solved the problem in a way which was little, if any, more satisfactory. A claim in the plaintiffs' patent for all ways of solving the problem in which the movement of the cylinder or of a sleeve in the cylinder was variable to the movement of the piston, could not, in my opinion, be sustained. . . . It appears to me that the present action is a somewhat audacious attempt to resuscitate a patent for an invention of small compass and, to say the most of it, of very moderate utility, and by the help of an amendment to make it cover and embarrass a wide field of enterprise in a comparatively modern type of mechanism. So far as I am concerned the attempt fails, and I must dismiss the action with costs."

Field to Remain Rambler Manager.

The Kelly-Field Co., which recently was organized and which will market the entire output of tires and other automobile products manufactured by the Lee Tire & Rubber Co., of Conshohocken, Pa., has located in the Buick building, at 1733 Broadway, New York City, where permanent headquarters for the company have been established. Despite rumors to the effect that Harry E. Field contemplated relinquishing the post of manager of the New York Rambler agency, which position he has held since he severed his connection with the Hartford Rubber Works Co., of which he was vice-president and sales manager, there is not even a remote chance of this coming to pass, according to Field himself, who stated to the Motor World man that he had not the faintest idea of leaving the Rambler branch. "You may make it as strong as you like," he added.

Director's Death Causes Receivership.

Because of the death of Dr. L. M. Early, a heavy stockholder and a director in the Barndt & Johnston Auto Supply Co., of Columbus, O., the affairs of that company were so affected that a receiver was appointed last week to take charge during the temporary unsettled condition. The officers of the company did not oppose the receivership, but contended that the company was solvent and that its liabilities of $15,000 are more than offset by bills receivable. The appointment was made at the instance of the City National Bank, which obtained judgment on a cognovit note for $5,000. Charles Barndt and W. R. Johnston will continue as managers.

Street Oiling That Led to Law.

Whether a municipality is or is not liable for damages for having oiled a street in front of a garage which resulted in an alleged falling off in business, is a matter which the courts will thresh out at Bowling Green, Ky. Suit has been instituted against that municipality by Henry W. and Harry Monroe, proprietors of the Bowling Green Garage, who claim that when the city saturated the street in front of their place of business with crude oil, their customers went elsewhere, and that they have sustained damages to the amount of $880 as the result.



August 17, Albany, N. Y.—Track races under the auspices of E. A. Moross.

August 21, Binghamton, N. Y.—Track races under the auspices of E. A. Moross.

August 24, Uniontown, Pa.—Hill climb under the auspices of the Automobile Club of Fayette County.

August 25, Columbus, Ohio—Two-hundred-mile track race of the Columbus Automobile Club.

August 26-27, Flint, Mich—Track races under the auspices of E. A. Moross.

August 30-31, Elgin, Ill.—Road races under the auspices of the Chicago Automobile Club and the Elgin National Road Race Association.

September 1-2, St. Louis, Mo.—Track races promoted by the Universal Exposition Co.

September 2, Washington, D. C.—Motor truck parade conducted by the Washington Post.

September 3-6, Chicago, Ill.—Chicago Motor Club's reliability run for commercial vehicles.

September 7, Hamline, Minn.—Track races promoted by the Minnesota State Fair Association.

September 7-9, Santa Clara, Cal.—Road races under the auspices of the Santa Clara County Fair Association.

September 17, Milwaukee, Wis.—Grand Prize road race under the auspices of the Milwaukee Automobile Dealers' Association.

September 21, Milwaukee, Wis.—Vanderbilt Cup race on the Greenfield course, under the auspices of the Milwaukee Automobile Dealers' Association.

October 7, Detroit, Mich.—Start of the National Reliability tour to New Orleans, for the Glidden, Anderson and National trophies.

October 7-11, Chicago, Ill.—Chicago Motor Club's reliability run.

Progressives for National Highways.

For the first time, during the last century at least, a national political party of really serious importance has committed itself to a policy of Federal aid in road building or to a system of national highways, at any rate. A plank of the sort forms a part of the platform of the newborn Progressive party, and there is small doubt but that the man responsible for it is W. H. Hotchkiss, one-time president of the American Automobile Association.

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LOYALTY AND ITS VALUE AS A BUSINESS ASSET

How "Standing Up" for the Line the Dealer Sells is Worth Money to Himself as Well as to the House He Represents—Why the "Knocker" is His Own Worst Enemy.

That a cloud of not insignificant origin was casting a shadow in place of the sunshine which ordinarily emanated from the Sales Manager's countenance was apparent even to those who knew him not at all; and as he swung aboard the Limited for the last leg of a long dealer-visiting tour even the colored porter knew better than to display smiles and Southern gaiety before the person with the storm-clouded face. Three weeks on the road, with short-length bed sheets, doubtful hotel fare and the dust and grime of summertime are not conducive to amiability in a thoroughly domesticated man, but a trip never before had "got to" the Sales Manager in such fashion; the ordinary trials of travel were expected and generally were accepted with cheerfulness, but the man of "punch"—that quality which makes the wheels of business spin—had a problem and no answer thereto.

With knit brows he sat in the smoking compartment, working hard at a Mongolian-hued cigar, and so intent were his cogitations that the trip from where he boarded the train to the town where Reilly held forth was one long continued and unbroken stare at the fleeting landscape with its bumper crops and thriving husbandmen. After the train stopped, Reilly, as previously arranged, climbed aboard and, although he saw his friend looked far from cheerful, he extended his good right hand and pumped as merrily as did the Sales Manager generally. Also, there came into the latter's countenance a ray of hope, a sort of a cheer-up-there-are-some-good-ones-left look, for Reilly, small of stature and shy of cranial hirsute adornment, was the one automobile dealer on the Sales Manager's staff who led all the others in vim and enthusiasm; he was never known to pass up an opportunity to boost his line, no matter what it was; he injected his personality into everyone with whom he came in contact, and that his bristling, bustling being was a valuable asset was evidenced by his sales profits at each annual reckoning. Reilly dropped his bag alongside the seat and settled himself for the ride into the big city where the factory was located. Having a thunder-cloud for a companion was not customary with Reilly, so when he took the third puff on the cigar the Sales Manager gave him he remarked, half-ironically, "Fine day, isn't it?"

"Don't know; I hadn't noticed it," was the sullen rejoinder, but as Reilly scowled disapprovingly upon such sentiment the cloud began to roll away.

"Reilly," said the Sales Manager, solemnly, "I'm convinced that we have the rankest bunch of dealers that a sales organization ever got together on one list; there's no name for them! You're the one bright spot in all my work, and if it were not for you I honestly believe I'd quit. I'm sick of it."

"Come, come," casually interjected the dealer, "you're blue in disposition today and you feel as if you were black with railroad dirt; you'll be all right after you get home and get a bath."

"No, I won't. I know I act sulky, and I do feel bad. I feel like a man who had gathered an army to do battle and then, when he went out to look them over, found he had picked up a disagreeable, dissentious, back-biting bunch that would rather fight for anyone than the man they happened to be hooked-up with."

"Hasn't the trip been satisfactory?" asked Reilly.

"If by 'satisfactory' you mean productive of contentment or any kindred feeling on my part, no. If you mean 'have I found out anything I needed to know,' it has been too satisfactory. As you know, I started out three weeks ago, and Ive seen a lot of dealers—all the big ones. Some are different from others, but, without trying to throw bouquets, there are none like you, Reilly. I suppose it's the same in almost every business, but the amount of what you might call disloyalty which exists to-day is not a thing to be smiled at.

"The first man I stopped to see was Grant, out on the other side of the state, and before I got out of his salesroom I was almost convinced that we had one of the poorest lines of cars on the market today. Grant started in and told me all about how this thing had gone wrong and that thing refused to work right and how all his trade was 'sore' and how they all vowed they never would buy one of our cars again, and before Grant got through talking he acted as if he believed what he was saying. I started an inquiry and found that, instead of any particular part or parts going bad, it was only those parts which are likely to be broken or put out of order in travel, and I finally asked him the names of some of his dissatisfied customers. I intended giving Grant an investigation, but I explained to him that I would try to smooth over some of the troubles and help him along.

"I went to see some of the men Grant said were so 'sore' on our cars. I found one man who is a contractor. He uses a touring car, carries supplies in it sometimes, gives everyone who wants it a ride, and he certainly 'pounds' his car. I told him I was from the factory and was around getting acquainted with a few of our owners, and I asked him how his car was going. He said, 'Fine! It's a great car. If I couldn't get another as good money couldn't buy it; I don't see how I ever did without it.' 'Have you had any trouble?' I asked him, and in view of Grant's story the reply surprised me. 'O, a little,' he said. 'I'd be surprised if I didn't; you ought to see what this car does every day.' We talked for nearly an hour, and he appeared to me to be far from a sulking and dissatisfied owner. It seems that he was out on a rough trip one day and broke a spring; when he took the car back to Grant to be repaired the contractor wasn't feeling as well as he might feel, seeing that the broken spring meant going back to a horse and buggy for a couple of days; and he told Grant he didn't believe the car was much good.

"The contractor told me he was somewhat surprised when Grant agreed with him that there were a great many faults in the cars and that he couldn't see why the company didn't build a good car. The contractor admitted to me that he didn't see why the spring hadn't broken before it did, and when he got the car back he felt as well satisfied as ever he did. Some of the owners, however, were real 'sore' with things; they had suffered accidents and, of course, laid everything to the car; and the amazing part of it is that Grant agrees with them. All of them are susceptible to argument, and instead of standing up for the line, Grant laid down and 'knocked' with the rest. He's one hell of a dealer!

"What he should have done was to act sensibly and stand up for the car, if for no other reason than that he is selling it. If he had explained to his trade that accidents and breakage will occur in the best of cars, that in the majority of cases the road and not the car is at fault, and that if the car were at fault he would fix it, he could get away with nine out of ten cases. He doesn't seem to realize how much it means to him and his income to boost the line he handles. The man who admits that he is hooked up with a poor line and who still continues to stick to it acknowledges to the public that he is out to 'trim' them; also, he sinks woefully in the estimation of himself and everyone else. Other owners whom I met were won over easily, and they said that, outside of one or two accidents for which they admitted they may have been to blame, the cars were doing noble work; most of them are really enthusiastic, and more of them would be if

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they came in contact with a man who was loyal to his line of goods.

"I went into other towns and in some of them found similar conditions, but Grant is the worst one in the whole lot. It seems to be a lack of loyalty. Sometimes a dealer signs up and somehow or other never gets out of his system the idea that the house is waiting for a chance to get the better of him, and that if he is loyal and a booster he is only making himself the laughing-stock of the trade. Instead of insisting that he is handling the best car that ever was and wouldn't handle it if it were not the acme of mechanical work, he sees too many faults and talks about them; he is only half loyal, and he is harmful to the house, himself and the owner. It's a shame he can't be made to realize it. I've been trying to find a solution, some way to get some enthusiasm into this lot, and that was what was worrying me when you came aboard."

"Why don't you try some kind of a house organ?" asked Reilly, who, anxious to be of assistance, suggested the first solution that occurred to him.

"I've thought of that, and will do it if I can't find any other way. Most of these dealers would be red-hot men if they only had it injected into them what loyalty means—both literally and financially. We try in every way to co-operate with our agencies. and still we are kept busy straightening out little kicks that could just as well be taken care of by the dealers themselves. Of course, there are owners who are chronic kickers and there are a whole lot of our dealers who are mighty good men, but this disloyalty in some of them has gotten on my nerves. If they would only look about them and see the methods that are pursued by the successful men, they would wake up with an awful jolt. There are towns where the cars which are not the best known in the trade in general are the big leaders; the top-notch cars have given way before the lesser known lines, until the people in those towns believe the so-called 'inferiors' are the best cars on earth. All that does it is the loyalty of the dealer; he believes in his line. You can call it what you please—selling ability, progressiveness, efficiency, or anything else—but it all dwindles right down to the loyalty of the man. If he is loyal he will boost his cars and the factory, and if he keeps on boosting he will become an enthusiast in spite of himself; and an enthusiast who has any selling ability is the man who makes the sales.

"You probably never stopped to realize, Reilly, that you were what might be called loyal, but you certainly are, and you will see it yourself if you stop to analyze the proposition. I would give a great deal if I had dealers who are half as good as you are. It was just the same when you were selling other cars before you signed up with us; whatever you have to sell is the greatest ever and the company that makes it is a red-hot proposition. I'm going to get some suggestions from you and see that they get into the hands of the other dealers, and I'm going to hand out a few little lectures myself."

"First thing you know I'll have your job," soberly remarked Reilly.

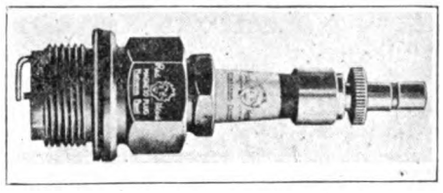
"Well, believe me, boy, if you put the vim into it that you do into your work now you would be one howling success; but you don't want my job—you're making more in six months than I make in a year."

"On the strength of that," said Reilly, "I'll buy."

The train was stopping, and as both men swung off they started for a cheering looking business place across the street—and the place was neither a barber shop nor a drygoods store.

Grossman Adds a Platinum Point Plug.

Almost any spark plug, however ordinary the materials used in its construction, will stand up for a time under light work, as, for instance, in a motor not hard driven and using battery ignition. When the conditions are severe, however, as they are when a high-tension magneto supplies the igniting current and the plug is used in a high-



NEWEST RED-HEAD PLUG

compression motor that is worked to its full capacity for long periods at a time, something very much out of the ordinary is demanded. It is to meet just such a demand, as well as the demand of users of ordinary cars who want plugs that will require changing only at very long intervals, that the Emil Grossman Co., of 250 West 54th street, New York, has produced its latest Red-Head spark plug, bestowing upon it the somewhat lengthy, but accurately descriptive appellation "Red-Head platinum point magneto plug." The new plug, which will be placed on the market about August 15, embodies nothing radical in construction, but the makers have sought to make it a thoroughly good plug by using in it thoroughly good materials. The chief points are the sparking points, so to speak; and as these are of pure platinum, there is nothing further to say except that the method of welding the platinum tips to the steel rods was worked out only after much tedious experimenting. The terminal will take snap, ring or slip wire terminals with equal facility. The porcelain core, the bushing and the shell are similar to those of other Red-Head plugs, but, as a distinguishing mark the metal parts have been heavily nickel plated and polished. Even the box has been made better; it is of torpedo shape, of the usual telescoping type, and near the bottom has a thread into which the plug screws, affording perfect protection to the electrodes.

Rambler Establishes Long Island Station.

Marking the invasion of the Long Island City (N. Y.) colony of service stations by another well-known brand of cars, the Thomas B. Jeffery Co. of New York has purchased a plot of ground at the corner of Jackson and Harold avenues and immediately will commence building operations on a modern service station. It will be three stories high, of concrete and steel construction, and will afford 50,000 square feet of floor space.

New Industry Locates in Hamilton.

For the purpose of manufacturing an inner liner for automobile tires, which is styled "Kant-Blo," the Hampton Mfg. Co. has been formed in Hamilton, O. S. B. Nusbaum, of Mooresville, Ind., is president of the new company, and Sol Allman is secretary. A factory has been acquired at 1500 West Washington street and manufacturing operations will be commenced at once.

Files Judgment Against Former Dealer.

The Dean Electric Co., of Elyria, O., this week filed judgment in the New York county clerk's office against Henry C. Flohr for $528.94, representing the costs of the action and amount of a claim for horns claimed to have been sold to Flohr in April and May, 1911. Flohr did business at 250 West 54th street, but is said to have been out of that particular trade for nearly a year.

Auto Lite Adds Electric Starter.

The Electric Auto Lite Co., of Toledo, O., which has been manufacturing an electric lighting generator for automobiles, has branched out, though in a not entirely different direction. An electric engine starter has been developed and will be sold in connection with the generator. October 1st has been set as the date for its formal debut.

Jay Leaves Jeffery for Haynes.

Webb Jay, who has been intimately connected with the automobile industry for a number of years, has severed his connection with the Thomas B. Jeffery Co., of Kenosha, Wis., to become assistant general manager of the Haynes Automobile Co., of Kokomo, Ind. C. B. Warren remains with the Haynes company as general manager.

Garrison Goes Over to Speedwell.

L. B. Garrison has been appointed to the post of manager of the Chicago branch of the Speedwell Motor Car Co. He succeeds Frank A. Groves, who has been promoted to the position of manager of sales, with headquarters at the Dayton factory.

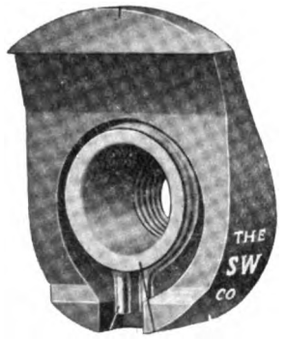
The Marion Motor Car Co., of Indianapolis, has established a branch in San Francisco at 346-348 Golden Gate avenue.

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"STANWELD" RIMS IN SEVEN TYPES

Well-Known Cleveland Company Develops New Line That Bears New Name—Locking Device a Feature.

Having obtained an enviable reputation by reason of the excellence of its automobile rims and other accessories, the Standard Welding Co., of Cleveland, O., has developed and shortly will place on the market a line of entirely new quick-detachable and quick-detachable-demountable rims which are distinct from anything else



DEMOUNTABLE RIM CLAMP

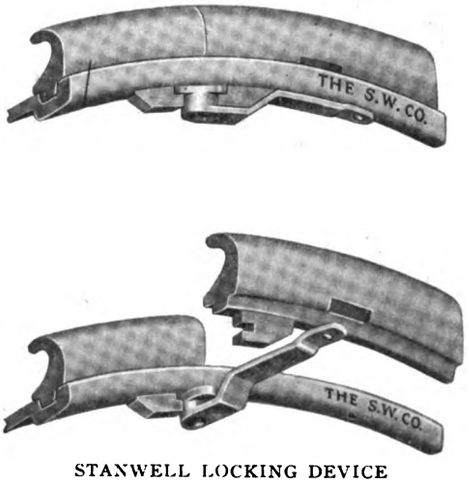
of their kind and which incorporate a number of features that are calculated to render them even more popular than their prototypes. The new rims, which are no less than seven in number, will be marketed directly by the Standard Welding Co. and will be distinguished by the name "Stanweld."

Despite the newness of the products, which, though unlike previous Standard rims, still are like them in many respects, they exhibit all of the evidences of careful design that always has been a feature of the Standard products, the constructional details having been developed along lines which it is expected will result in material saving of time in changing tires while at the same time providing an even greater factor of safety than has been possible heretofore. Of the seven types of rim which are included in the new line, three of them are of the well-known quick-detachable pattern and are designated Types 50, 51 and 52, and the other four are of the demountable type; the latter are designated Types 30, 40, 41 and 42, the three last named being identical with Types 50, 51 and 52, except that the tire-carrying rims are demountable.

In the plain quick-detachable rims and in the combination Q-D demountable rims, a new locking device which is of extreme simplicity is employed to ensure that the split ring is maintained properly "bottomed" in the channel provided for its reception in the base of the rim proper. Two slotted lugs are provided on the base of the split ring, one on each side of the cut and adapted to fit into corresponding holes which are stamped in the channel which retains the ring. A cam with two faces which enter the slots in the lugs and "bolt" the latter in the holes, is pivoted to the metal strip which separates the holes. A handle serves to turn the cam and release the lugs and retaining ring. When the cam is in the locked position, the handle is held in place snug up against the rim by a ball and recess catch. To make a tire change necessitates the use of a screwdriver only, the tool being applied first to start the handle and later to pry the ring from the retaining channel after the lugs have been released by the turning of the cam.

Only in the shape of the flanges which retain the tire bead do the two types which are adapted for straight sided and for clincher tires differ; these are known as Types 51 and 52, respectively. The type which is adapted for the use of either type of tire, however, and which is known as Type 50, differs from the other two in that two rings are provided, both of which are reversible, though only one is split. The solid ring is retained in position, when the tire is in place, by a flange at the back of the rim. By reversing the rims either a flat surface, which is intended for use with straight sided tires, or a surface provided with an overhang which grips the bead of tires of the clincher type can be utilized.

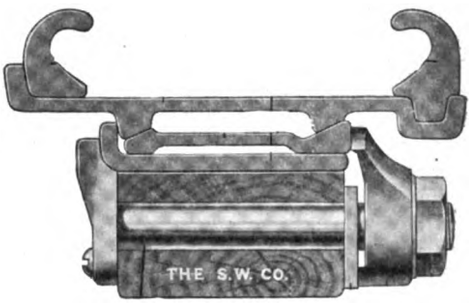
Exactly the same construction obtains with the detachable ring of the quick detachable demountable types. The de-



STANWELL LOCKING DEVICE

mountable portion of these rims is held in place by six retaining clamps, which, however, do not act directly on the rim itself but act through the intermediary of an expanding, tapering ring. Consequently, they do not bear the full brunt of road shocks which tend to tear the rim from its position on the periphery of the wheel. The expanding ring, which is split, is adapted to slide on a flat rim which covers the wooden fellow of the wheel. Two flanges which are formed on the outer surface of the expanding ring engage with two similar flanges formed on the inner surface of the demountable unit of the rim on which the tapers are in the reversed direction, so that when the expanding ring is forced into place between the non-demountable and the demountable portions of the rim, the latter is locked firmly in position.

A flange at the rear of the non-demountable portion of the rim which engages with the inner flange on the inside of the demountable portion, prevents the latter from slipping off at the inside of the wheel when the expanding ring is forced into place by the action of the clamps. Needless to state, the rim is brought into proper position with regard to the plane of the wheel by the action of the expanding ring, and thus "wobbling" which causes excessive tire wear is prevented. The fact that the locking ring expands, it is claimed, absolutely assures that the rim is centered, and the provision of two flanges on both rim and ring obviates warping, which would tend



Q. D.-DEMOUNTABLE TYPE

to throw the rim out of the plane of the wheel and thus increase tire wear.

The clamping device is so arranged as to reduce trouble to the minimum, the clamp pieces being forced into engagement with the expanding ring by the action of the nuts on the bolts which protrude through the wooden fellow of the wheel. The clamp pieces themselves are held in frictional engagement with the nuts so that when the latter turn the clamp pieces also turn. The turning motion, however, is controlled by a stop which, when the clamp nut is being tightened, stops the clamp in proper position to engage with the expanding ring. When the nut is being loosened the clamp is stopped in position so that the rim may be slid off the wheel without interference. The bore of the clamp is somewhat larger than the diameter of the bolt, so that quite a little lateral play is permissable without fear of straining the bolt.

A foot piece or lug which is provided on the clamp insures that the head portion which engages with the ring will always be in contact with the latter. The clamp is provided with a small spring which is housed in an internal cavity and which provides the necessary frictional contact with the adjusting nut. A very few turns of the latter suffices to bring the expanding ring into proper position. As with the quick-detachable rims, the demountables are designated by the tires they are adapted to carry. Type 40 takes either straight side or the clincher tires; Types 41 and 42 take straight side and clincher tires, respectively.

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Type 30 rim is quite different from any of the others and has been developed to fill the demand for an exceptionally light rim in which strength is not sacrificed to lightness. It is a circumferentially locked rim, both sections of the rim base having the tire gripping flanges made integral with the base. The abutting edges of these sections have inwardly protruding lugs which, when the rim is locked, are bound securely together by means of rings of spring steel slotted to accept the protruding lugs. The spring rings, of which there are only two, are riveted to one section of the rim base and therefore do not constitute loose parts.

To detach a tire it is only necessary to loosen a retaining catch and pry up the ends of the spring rings. The two sections of the rim base are then saparable. There is absolutely no friction of parts to overcome in locking or unlocking the two sections of this rim, as no circumferential movement of either section is necessary. The demounting device consists of several wedges operating on bolts extending through the felloe. These wedges form a simple yet efficient method for holding the rim base with its tire on the wheel. This rim is produced in both the straight side and clincher types.

Eiseman Establishes Indianapolis Branch.

Forging the first link in a chain of branches which will be established in practically all of the larger cities of the United States, and which will act as service stations as well as distributing points, the Eiseman Magneto Co. has established a branch in Indianapolis, Ind. In order to carry out the comprehensive plans of the company, a whole building at 514 North Capital street has been leased, and, in addition to housing the general offices of the branch, will be fully equipped as a repair station. Lon R. Smith, who for several years has been Western representative for the company, has been placed in charge.

New Officers for Benz Company.

Paul V. Clodio, who for the past two years has been connected with the Benz Auto Import Co. of New York City, distributer of Benz pleasure cars and Benz-Gaggenau commercial vehicles, has been elected to the secretaryship of the company, succeeding Walter Maass, who has returned to the parent company in Mannheim, Germany. Clodio assumed his new duties last week, his election being by way of filling the gap which was left when earlier in the year Paul R. Pelz, who formerly was connected with the factory was made president and treasurer of the company.

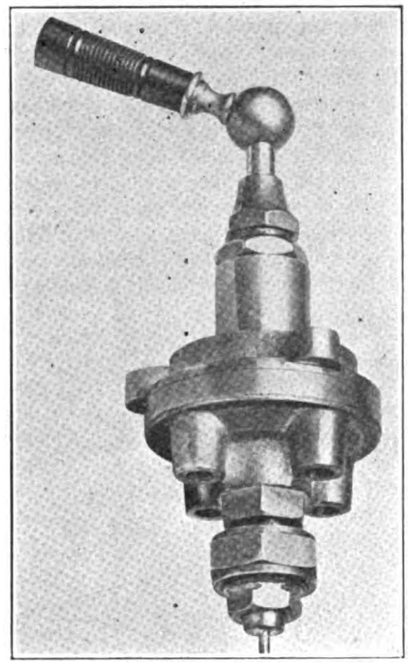
New Everett Distributor for Indianapolis.

The Indianapolis Motor Car Co. has been organized in the Indiana city for which it is named and will handle Everitt gasolene and Flanders electric cars. A. W. Martin is president, and P. H. Smith secretary and treasurer. Headquarters have been established at 427 North Meridian street.

DISCO DIMENSIONS DIMINISHED

Efficiency of Pioneer Acetylene Starter Increased Though Its Size Is Reduced—New Check and Priming Cock.

Though it is true that the fundamental principle upon which the Disco motor starter operates is unchanged, the device having a dashboard distribtuing valve which controls the delivery of acetylene to the cylinders of the engine, the outward form has been so altered by the Ignition Starter Co., of Detroit, in developing the 1913 model—known as model 16—that its friends hardly will recognize it. Hand in hand with the changed exterior go several improvements in the matter of actual operation. The distributing valve itself,



DISCO STARTER VALVE

for instance, the controlling handle, which is all that appears on the driver's side of the dash, operates a needle valve, and is turned one way to open and the reverse way to close, instead of being swung through a complete revolution, as in the old type. The handle and the valve body are of entirely new design, and are shown in the accompanying illustration; the valve is of the needle type, and admits the gas to the engine in two charges instead of one, thus improving the explosive mixture.

Part of the regular Disco equipment is a new combination check valve and priming cock. In outward appearance it is merely a well-designed priming cock with a union on one side of the body for the attachment of the gas pipe from the dashboard distributing valve, though in reality it is a good deal more. It contains a ball check valve so arranged with relation to the valve plug and passages that when the handle is placed in a vertical position the check valve is operative, and gas will be admitted from the distributer, but egress will be checked. Turning the handle to the left opens a passage through which gasolene can be injected direct into the cylinder, while turning it to the right opens a passage through which the ball check can be blown clean while the engine is running. The projecting shank of the cock is designed to deliver gas in the cylinder with reference to easy and certain ignition—a matter of the utmost importance in the installation of a starter of the acetylene type.

Apart from the improvements that have been brought about in the operation of the Disco starter, the new model has the advantage that it is very much more compact than the older type, which not only improves the outfit in the matter of appearance, but also makes its installation less difficult in places where the space available for the purpose is limited.

Seitz Enters Motor Transportation Co.

William J. Seitz, who is president of the Seitz Motor Truck Co., of Detroit, is the moving spirit and has been made president of the Heavy Tonnage Transportation Co., which recently was incorporated with $150,000 capital in Toledo, O., for the purpose of carrying on a general transportation business in which motor trucks will be used exclusively. E. A. Mallory is vice-president and general manager of the company and Jacob Brecheisen and Clarence B. Hadden treasurer and secretary, respectively. Already a number of transportation accounts have been secured, and headquarters have been established in the Meredith building, on the corner of Jefferson avenue and Michigan street, where the whole lower floor has been remodeled into a modern garage and repair shop.

American "Rubberine" Company Formed.

Having manufactured "Rubberine" by himself for three months at 233 West 50th street, New York City, Chase Morris, who has the American rights to an English tire filler patent, has turned the business over to a corporation which is styled Rubberine Tire Filling and Sales Co., papers of incorporation having been filed this week. The company is incorporated under New York laws with $500,000 capital. The incorporators are James D. Bridges and J. Curtis Clark, of 233 West 50th street, and George H. Davis, of 146 East 32nd street.

International Shares Now "On 'Change."

The New York Stock Exchange has admitted to its list $12,051,112 in preferred stock and $14,812,100 in common stock of the International Harvester Co., of Chicago, Ill., which manufactures the I. H. C. light commercial vehicles and agricultural tractors. Harvester company voting trust certificates, both for common and preferred stock, however, have been stricken from the list.

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OVERLAND ADDS FULL EQUIPMENT

Two of the Models Have Simple Electric Lighting and Starting System—Few Other Changes of Note.

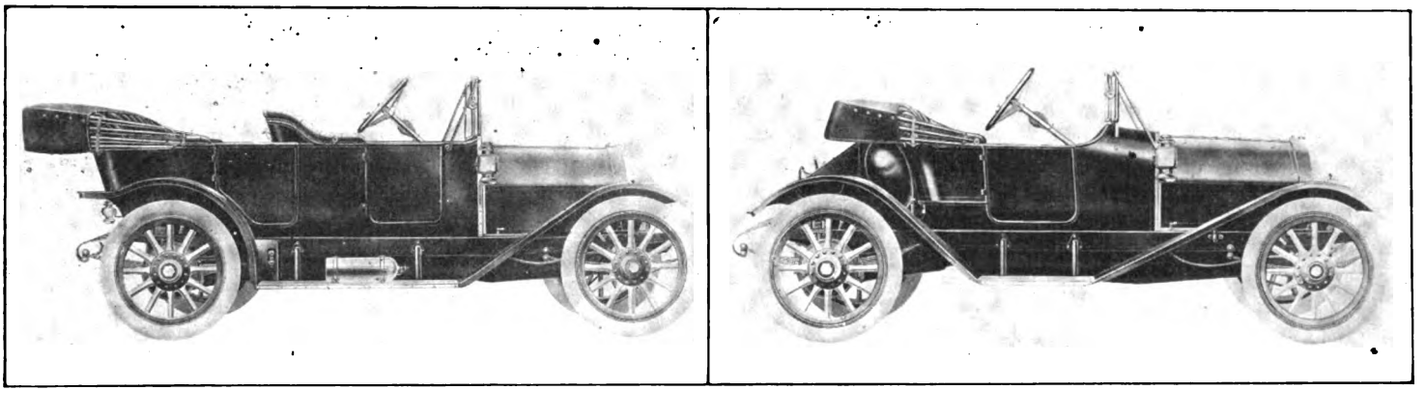
Two chassis models, which will mount four different styles of bodies—five-passenger touring car, four-passenger torpedo, two-passenger runabout and three-passenger coupe—will constitute the revised Overland line, which is built by the Willys-Overland Co., of Toledo, O. The larger of the two is a 45-horsepower car, listed at $1,475, which is $25 less than the price of the model which it succeeds, despite the fact that the new car, like all the other Overlands, is sold for the first time with complete equipment. An additional feature of the large car, though it is one which raises the price $175, if specified, is a complete electric lighting and engine starting system. The smaller of the new models is the successor to, and practically the same as, the former 30-horsepower chassis, though some changes have been made in the chassis details and there has been a notable augmentation in the matter of standard equipment, which now includes, among other things, an acetylene engine starter; the price is $985, for the five-passenger touring car, the torpedo touring car or the runabout.

In selecting a starting and lighting system for the larger car, cognizance was taken of the importance of simplicity both in construction and operation, of the advantage of an apparatus having a small number of moving parts and, of course, of efficiency and reliability of operation. To these ends the U. S. L. system has been adopted for the abolition of the crank and the illumination of the car. Chief among the component parts of the starting system is the combined electric motor and generator, which is mounted on the motor shaft in place of the usual flywheel, the functions of which it performs in addition to acting alternately as a starting motor and a generator of electricity. When the engine is running the current generated by the flywheel generator charges a storage battery, and for starting purposes the current from the battery is switched on and the generator becomes a motor, starting the engine. Of course, the current is available for lighting and ignition purposes. A strong point in favor of this type of apparatus is the absence of extra moving parts and of bearings and gearing, and the consequent freedom from wearing parts.

In the metamorphosis of model 59 which has changed it to model 69 the wheelbase has been lengthened from 106 to 110 inches, which serves the double purpose of improving the already rakish appearance of the car and of bettering its riding qualities. In place of a semi-floating rear axle there has been installed a three-quarters floating axle with Hyatt roller bearings and driving shafts of 3½ per cent. nickel steel. In the very important item of brake equipment a marked improvement has been made, for the brake drums, formerly 10 inches in diameter, have been made 13 inches in diameter on the inside, where the internal expanding rings take their bearing, and 13⅜ inches in diameter outside, at the contracting band bearing; the width has been increased from 2 to 2¼ inches.

The brake operating mechanism has undergone considerable revision; in fact, it is of a new design altogether. Instead of two separate shafts, one for each brake, there now is a tubular shaft working on a solid shaft, each acting upon a pair of brakes. Stops have been placed on the brake pedals so they cannot come in contact with the floor boards, and the same is true of the clutch pedal. As a precaution against the "freezing" of the torsion tube to the torsion tube yoke, a great pocket has been formed between the two, in which ample lubricant is carried. Pressed steel replaces a casting in the cover of the differential housing, with a consequent reduction in weight, to say nothing of a somewhat better appearance. Where oil cups formerly were used, grease cups have been substituted. The increase of wheelbase has made it possible to add appreciably to the comfort-giving dimensions of the body work; without causing an appearance of ungainly height. There is a greater distance between the seat cushions and the top line of the body, so that considerably more ease is acorded by giving better support to the passengers' backs, and the arm rests are more comfortable.

The 30-horespower motor is not changed, unless the term can be applied to the cutting of oil grooves in the pistons below the bottom rings, with small drain holes to carry off surplus oil, the employment of a new variety of oil retaining washers on the push-rod guides, an increase in the areas of the breather pipes, and the use of intake manifolds that are flanged, instead of threaded, so that carburetter removal is greatly facilitated. The bore and stroke remain 4 inches and 4½ inches, respectively, and the cylinders are separately cast; ignition is by Remy magneto with dry battery for starting, cooling by thermo-siphon action with cellular radiator; and the motor is lubricated by splash, so far as the crankshaft and camshaft bearings are concerned, and by force feed from a Kinwood oiler for the cylinders. The crankshaft is well supported by five bearings. The transmission system includes cone clutch and three-speed selectively controlled gearset.



OVERLAND FIVE-PASSENGER TOURING CAR AND TORPEDO ROADSTER ON 30 HORSEPOWER CHASSIS

One of the bodies mounted on the model 69 chassis is a three-passenger coupe; and largely because this type of vehicle is much favored by the gentler sex some extra attention has been paid to the "fixings," and the car is equipped with the W. S. L. electric starting device and is electrically lighted throughout. The upholstering is of a better quality all around than was the case in last year's cars, but this is equally true of all the new Overland models. In conformity with the increased equipment, the car lists at $1,500.

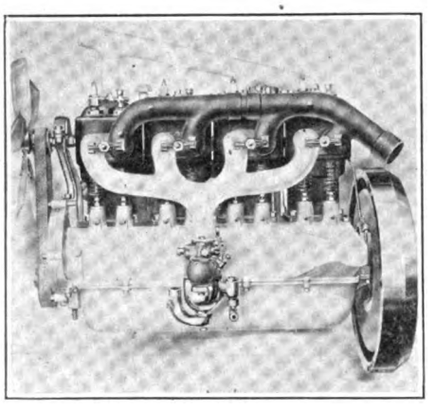
The seats in all models are covered with black machine-buffed leather, pebble grained and tufted. The front seat of the touring car is divided, each cushion being 18 inches wide and of the same depth, with a height of 15 inches from the floor to the top of the cushion. The roomy rear seat is 46 inches in width, 18 inches deep and 16 inches high; there is a distance of 23 inches from the front of the tonneau to the

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rear seat—that is, 23 inches of leg room. The front door opening is 18 inches wide and that of the rear door 20 inches.

In matters which affect appearance alone the Overland cars have been considerably improved. The former finish of blue throughout has given place to blue for the body, with gray wheels, black hubs and black striping. Last year's brass trimmings have given way to the more modern, and what is more to the point, more attractive, black enamel and nickel.

That the car is being kept at least abreast of the times in the matter of equipment is indicated by the difference between the outfit that accompanied the 1912 model and that which goes with the new cars. The former list included three oil lamps, two gas lamps, generator and set of tools. The new list comprises an acetylene motor starter, two gas headlights, with Prest-o-lite tank and hose, oil side and tail lamps, foot rest and robe rail finished in nickel and aluminum, top and top cover, glass windshield, Warner speedometer, tire carriers on the back of the car and the usual set of tools and tire repair outfit. Running boards and floor boards are covered with cork linoleum, bound with aluminum, and the floor of the tonneau is covered with a rubber mat.



VALVE SIDE OF OVERLAND MOTOR

Pipe Wrench That Is Easily Made.

An easily made pipe wrench, and one which will not mar the work, consists of a piece of belting with one end fastened to a piece of wood. The stick is held with the side bearing the leather on top. The belting is bent over the edge of the stick and brought around the pipe and doubled on itself, the free end being grasped by the hand which turns the handle. The more force that is applied to move the pipe the harder will the wrench grip.

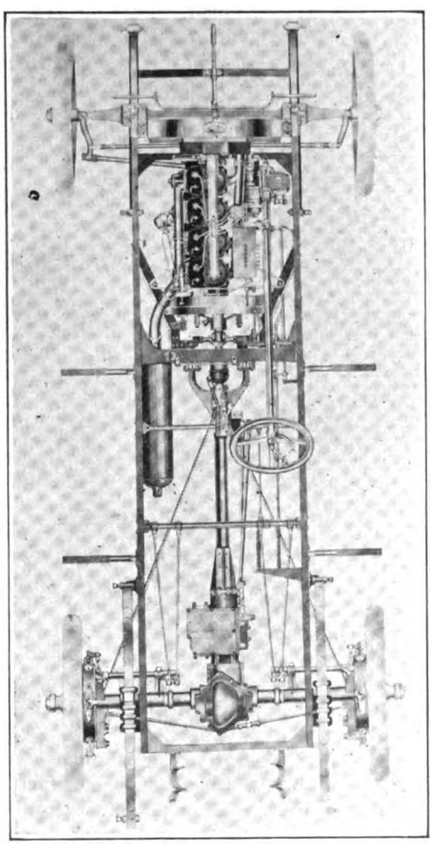
Acid That Affects Graphite Mixtures.

In mixing graphite with oil for cylinder lubrication, the greatest care should be exercised to see that the oil used is absolutely free from acid. It is said that acid caused the graphite to precipitate and form hard masses, which naturally have a deleterious effect on the running of the engine.

TAKING UP WEAR WITH BABBIT

Method That Restores Lost Vitality to Worn Bushings—Easy, Effective and Inexpensive Bearing Repair.

When a solid bushing in a motor of more or less recent design becomes worn and needs replacement, it usually is a comparatively simple matter to obtain a new bushing and put it in the place of the old part. When, however, the machine is of ancient origin, or if for any other reason renewal parts are not obtainable, the usual method is to have a new bushing specially made, which is a rather expensive proceeding, as a rule. If the wear of a bushing is not excessive and is fairly uniformly distributed, there is a rough-and-ready method of taking it up that often has served very well.

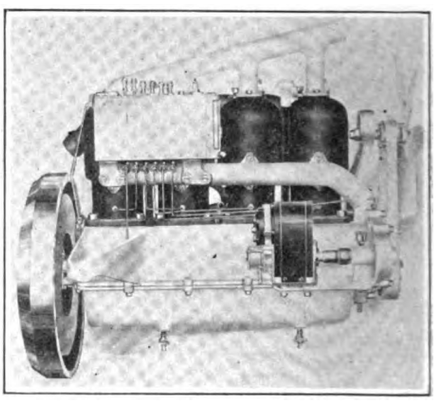


OVERLAND 30-HORSEPOWER CHASSIS

The old bushing is first thoroughly cleaned, so as to remove every trace of oil and grease, and the inside is "tinned" in the usual way with solder and a flux, the coating of solder being made as thin as possible. The bushing is placed on end on a piece of asbestos, so as to form a sort of cup, while still almost hot enough to melt solder, and held down firmly while it is poured full of good babbit metal. Almost immediately the metal must be poured out again, and there will be left in the bore a coating of babbit the thickness of which will depend upon the extent of the cooling that has taken place. A few trials may be necessary in order to obtain a coating of the proper thickness, when the bushing should go on the shaft very tight indeed, so that by the time the high spots are scraped down there will be a fairly good bearing surface. If the bushing is rather large it can be dipped into melted babbit after tinning, the outside being rubbed with a little grease to keep it clean.

Leaks That Waste Acetylene Gas.

"Leaking pipe lines are a frequent but perfectly needless source of waste," says President Fisher, of the Prest-O-Lite Company. "The trouble lies almost always in the carelessness of the user. Complaints of short measure and excessive gas consumption are always traceable to leaks. The peculiar feature of this is that if the owner will spend but a few moments in testing the tubing from the tank to the lamp, the waste will be eliminated, and in many cases the life of each tank of gas will be doubled. First disconnect the rubber tubing at the lamps and pinch or clamp the ends tightly. Go over every inch of the rubber and brass tubing and each connection with heavy soap suds, seeing that every portion is thoroughly covered with it. Then turn on the gas. A leak at any place will be shown at once by the formation of a bubble. If it is formed at a connection, this should be tightened at once. If the bubble appears on any portion of the tubing (either rubber or brass) it is a sign that the tubing should be replaced or repaired.



OVERLAND MOTOR, MAGNETO SIDE

"The places where the rubber is joined to the brass tubing should be watched carefully, as they are a prolific source of leaks. Wherever the brass tubing is run through the frame or mud apron, it should be protected from wear. When all of the tubing and joints have been tested and connections to the lamps, the lamps themselves should be tried for leaks. Put soap suds around the base of the tip and on the stem which holds the tip and on the rubber tube joint at the lamps. Then turn on the gas and light the lamps. If bubbles appear at the joint in the stem inside of the lamp, this stem should be unscrewed and the threads covered with white lead."

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LARGER MOTOR FOR CADILLAC LINE

It Is of the Long Stroke Type Though General Design is Unchanged—Few Other Alterations.

Complete details following the incomplete advance information concerning the revision that has taken place in the Cadillac line show that while the new chassis is bigger, though lower hung than its predecessor, and the power of the motor has been increased from 18 to 25 per cent., the actual constructional changes have been comparatively slight—less, perhaps, than might have been expected in view of the very considerable increase in horsepower. As a matter of fact, the Cadillac design has been so thoroughly worked out and has withstood the tests of time and service so well that adherence to that design, with here and there an improvement or an alteration suggested by experience and the constant augmentation of engineering skill and knowledge, is merely the logical course.

The principal change, perhaps, is in the engine itself, which, in increasing its rated power from 32 to 40-50, has acquired new cylinder dimensions that place it in the true long stroke class; the cylinders formerly were "square," both bore and stroke measuring 4½ inches, but in the new models the stroke is 5¾ inches, the bore remaining the same as before. In line with the augmentation of power, the crankshaft diameter has been increased from 1⅝ inches to 2 inches and the crankshaft, formerly ¾ inch in diameter, now is 1 3-16 inches, with cams integral. The increased demand of the motor for "mixture" is met by increasing the diameter of the valves, which now measure 2⅛ inches. Much has been done to quiet the motor by enclosing the valve stems in individual cylindrical casings and by using a "silent" chain drive for the cam shaft and also for the motor starting and generator drive.

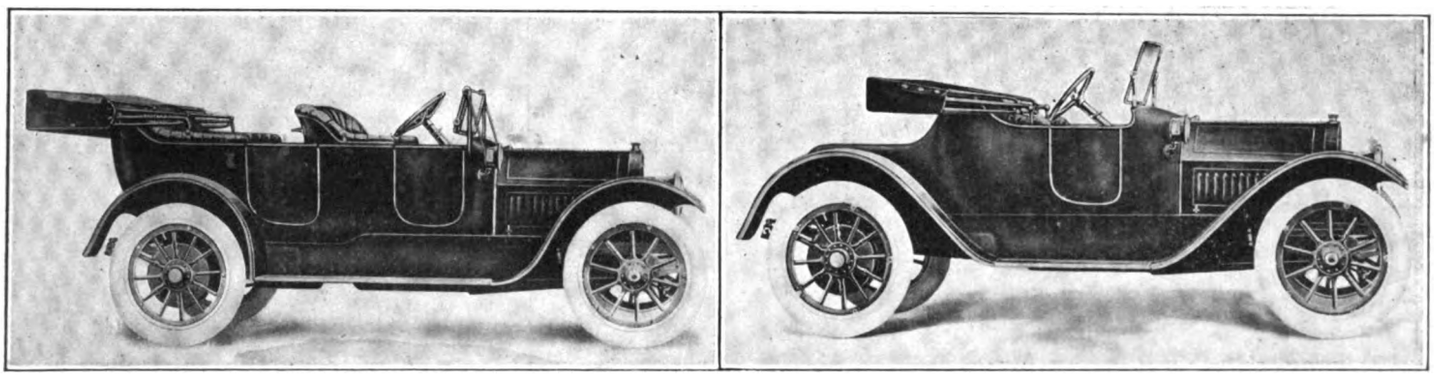
The electrical system which centralizes the ignition, lighting and starting apparatus is, as formerly, the Delco, though greatly improved by virtue of the knowledge gained by a year's practical experience and by changes made by the Cadillac company to render the apparatus more suitable to its own particular conditions of service. The electric motor which furnishes the power to start the engine also acts (when driven) as a generator for supplying illuminating current through the medium of a storage battery, there being two sets of armature windings, one set for use when the machine runs as a motor and the other for generating purposes. Ignition current is taken direct from the generator. The whole system is simplified by the elimination of the controlling switch and the ampere-hour meter; the low potential of the current—only six volts—is another distinct advantage in that it is extremely easy to insulate and losses through leakage and short-circuiting are less likely to occur. A voltage regulator is an important detail of the equipment, for it automatically varies the battery charging current so that when the battery is exhausted the charging current is delivered at its maximum strength and replenishment proceeds rapidly, while the charging rate is reduced as the process nears completion. This arrangement has an important bearing on the life of the battery and the kind of service it renders.

The speed of the starting motor—and consequently of the engine when being started—and the number of times the engine can be started on one charge of the battery have been practically doubled, largely through the increased gear ratio between the motor pinion and the large gear cut on the rim of the flywheel with which the motor pinion meshes; the ratio, formerly 20 to 1, now is 25 to 1. Two entirely separate ignition systems safeguard against trouble in this vital part of the power plant. In addition to the system taking current from the dynamo, there is a dry cell battery working through a Delco distributer to a separate set of plugs. Virtually the owner of a Cadillac can put both starting crank and ignition troubles on the list of things to be forgotten.

The generator ignition is under the control of a ring governor, eliminating much of the bother of manually regulating the time of ignition. The little things that mean so much in the long run are by no means ignored; for instance, the lamps are all fused, so that if for any reason there should be an excess of current they will not be burned out; the lamp wires are made invisible by running them through the brackets that support the lamps; the ignition switches are of improved design and are more conveniently located than before; and the ignition switch is provided with a Yale lock to guard against tampering. Apart from the staggering of the radiator tubes, with a view to bringing about a slight increase in cooling capacity, the foregoing covers the new things that are to be found at the engine end of the car, barring a change in the carburetter, which now has no gasolene adjustment, the feed being fixed; there is but one adjustment—an air opening—besides the air regulator on the steering wheel.

Back of the dashboard and under the floor there are even fewer changes. The most notable departure from the older model is the dropping of the front axle 1½ inches, which permits the entire frame to be lowered an inch and still leaves an extra half inch for play on the springs—a desirable feature when the going is very rough. It hardly can be expected that any very considerable increase in easy riding could be brought about in a car so well hung as the 1912 Cadillac; the new model, however, has been given a wheelbase of 120 inches, which is an increase of four inches over the previous model; the rear side springs are four inches longer, and the tires have been increased from 4 inches to 4½ inches in diameter, the wheel diameter remaining at 36 inches. Easier steering is brought about by the fitting of Timken roller bearings to the tops of the steering spindles. The use of the front door on the right-hand side has been made possible by placing the emergency brake lever inside. In response to the demands of the larger engine, the lubricating oil capacity has been increased by 100 per cent.; this not only provides for the additional requirements of the engine, but increases the mileage that can be made on a single filling; the oiling system now holds six quarts.

The seven models that are listed all are mounted on the same chassis; they com-

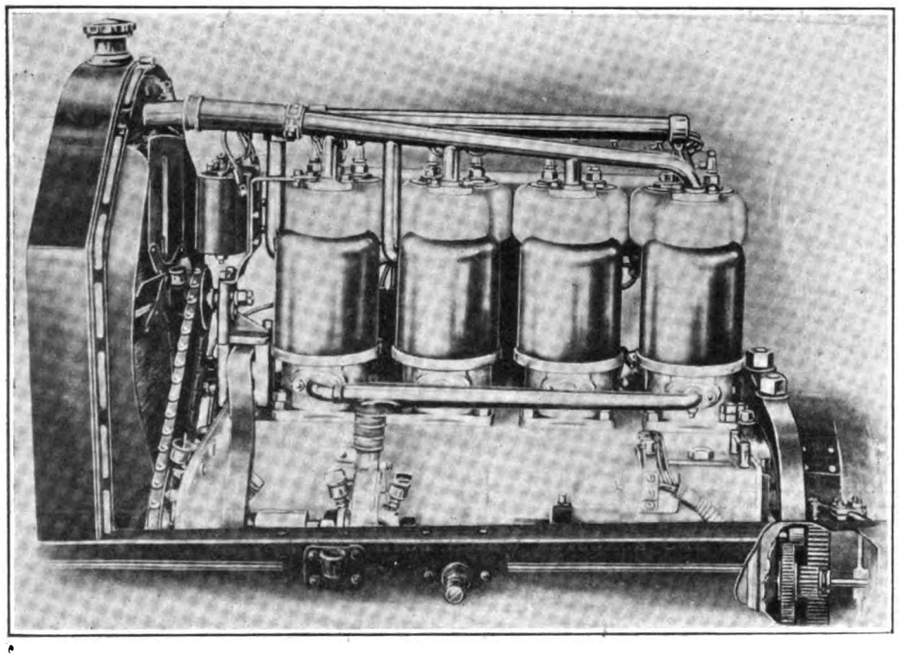


CADILLAC FIVE-PASSENGER TOURING CAR AND ROADSTER WHICH BOTH LIST AT $1975

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prise a five-passenger touring car, a six-passenger car, four-passenger phaeton, two-passenger roadster, four-passenger torpedo, four-passenger coupe and seven-passenger limousine. Notwithstanding the very marked improvements that have been made, the prices are not increased greatly—in fact, the limousine is listed at the old price. The greatest increase is in the price of the coupe, which has gone up $250, while the other models have had their prices augmented in a lesser degree, the prices of the standard touring car being $1,975, which is $175 more than was asked for the previous model.

Standard equipment, which is included in the price of each car, is practically the same as in previous models, though a trifle fuller and somewhat improved in its component details. The list includes a mohair top, clear vision windshield with rain vision and lower ventilation adjustments, especially designed lamps with black and nickel trimmings, the headlights having adjustable globes to regulate the diffusion of light; Hans gasolene gauge on the dashboard, horn, foot and robe rails, cocoa fiber mat in touring car, Warner speedometer with electric light, tire irons and the usual tools, jack and tire repair outfit.



CADILLAC 40-50 H.P. MOTOR SHOWING STARTING GEAR

Timken's Way of Checking a Process.

One of the interesting features of the process of manufacturing Timken roller bearings is the use of a secret check on the regulation of heat in the furnaces used for heat treating steel at the factory in Canton, O. It is absolutely necessary that the temperature shall not vary more than a given amount. Naturally the factory heads cannot spend all their time with their eyes fixed on the pyrometers, as the electric thermometers are called, so a recording dial is installed in the office of the chief engineer, and this gives a continuous record or "curve" showing the exact temperature at all times. It may be connected with any furnace at the will of the chief engineer, but no one but the chief himself knows what furnace is under observation. The effect is to make the men entrusted with the heat regulation extremely careful, to the benefit of the product.

Providing for Wear of Pistons.

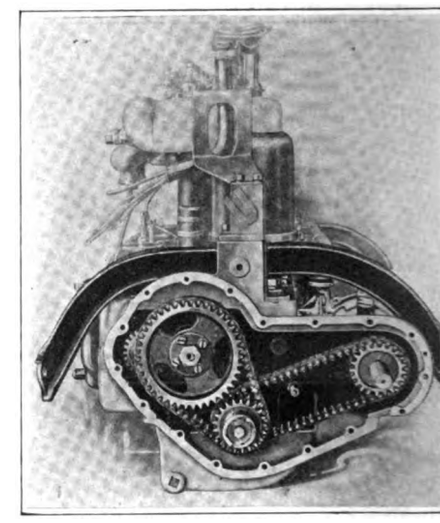
Owing to the fact that pistons always are made a trifle smaller than the cylinders in which they work, and that in time they wear still smaller, there sometimes is a slight knock under certain conditions, when the piston reverses the direction of its motion. With a view to obviating this noise by eliminating the space between the piston and the cylinder walls, the makers of the English Napier cars have patented the plan of making the lower part of the piston large enough to fit closely in the cylinder, and cutting a number of slits through the piston wall extending the full length of the enlarged portion. The result is to make the lower part of the piston slightly yielding, so that wear will be followed up, as it is in the case of piston rings, and expansion by heat will result only in the slight springing of the sections between the slits.

Power Entailed in Spinning Dynamo.

An idea that is quite common and that dies a surprisingly hard death is that a gasolene motor that drives a dynamo has an easy task, the belief being that the energy required is only that needed to overcome the inertia of the armature and the friction of the bearings. Nothing could be further from the truth, for the generation of electricity entails a powerful attraction between the armature and the field magnets, and this attraction opposes a strong resistance to the engine in turning the shaft. The strength of the pull is in direct proportion to the current generated and, moreover, it is constant and unremitting, so that the engine has to work every instant. A very common remark, elicited by the sight of a gas-electric motor truck, was "What do you want such a big engine when it has nothing to do but spin the dynamo?" the idea being that "spinning the dynamo" caused that machine in some mysterious way to give out vastly more power than was put into it by the engine.

Horn Location that Requires Thought.

Not a little forethought and judgment should be exercised in choosing a proper place to mount a warning signal, either electric or of the bulb variety. Obviously if the device is mounted behind a mudguard the sound is deflected and a portion of the noise never reaches the person approached. The dash mounting is much better, though in some cases it is not possible unless the horn is fitted with an "abbreviated" projector so that the device does not interfere with the movement of the hood cover.



CADILLAC CAMSHAFT DRIVE

Test that Emphasizes Shocks and Jars.

Something like an adequate idea of the shocks and jars that are sustained by the axles, bearings and other parts of a car below the springs can be gained by riding on a stripped chassis standing on the rear axle while the car is going over an ordinary road. The work done by the springs and by the upholstery of the seats will be warmly appreciated after an experience of this sort, and it will be quite easy to understand why it is necessary to use fine material and workmanship in the construction of axles and wheel bearings.

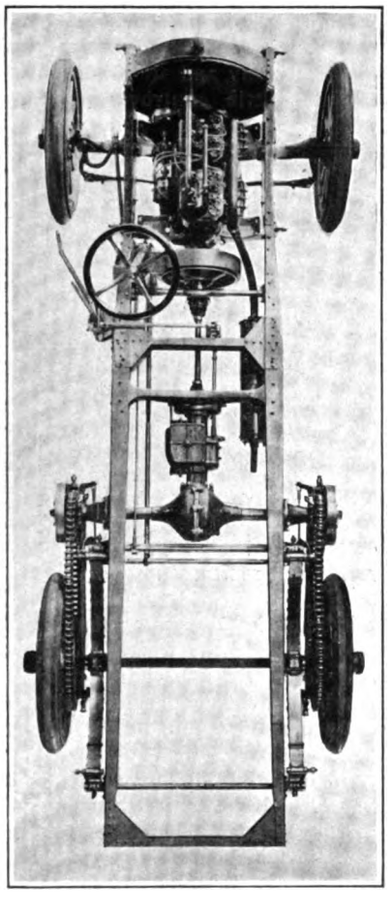
Brake linings should be watched when they begin to wear to see that they do not wear through so as to allow metal-to-metal contact between band and drum. If this is permitted destructive wear ensues.

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TRUCK PROBLEMS; THE PLACE FOR THE MOTOR

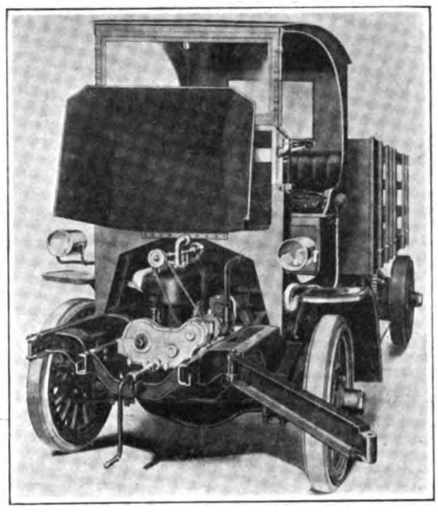
Locations Which Prevail and the Reasons for their Preference—When the Service Required May Render a Particular Arrangement Advantageous—Pros and Cons of Two Favored Positions Discussed and Made Plain—Influence That Vehicle Capacity Exerts.

Passing through its period of adolescence the motor truck in the concrete virtually has become the motor truck specifically. Which is to say that the day of special adaptions no longer is just dawning, but that it is here in earnest. Although the tendency in the commercial vehicle industry never has been as marked as it is in the pleasure car field to manufacture a quantity of vehicles of identically the same pattern and practically to make the vehicle fit the purchaser instead of first ascertaining what the purchaser requires and then making the vehicle fit him, which is the logical method and the method which in the end is productive of the best all around results, the tendency still persists in a quiet sort of a way.



FEDERAL MOTOR UNDER HOOD

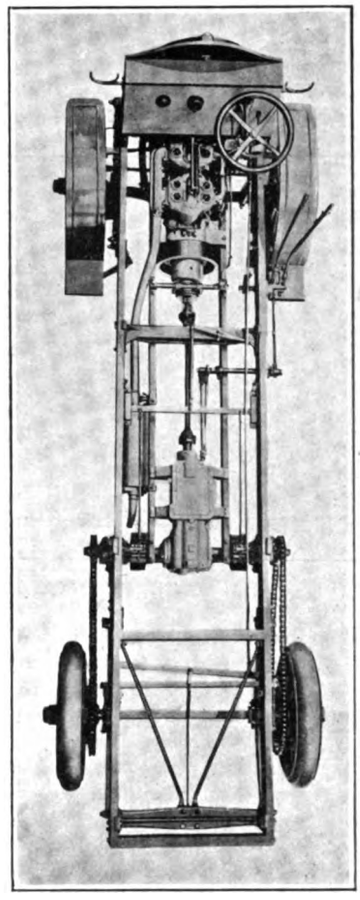
The whole idea expressed by motor trucking, however, is service and efficiency, and the tendency slowly but surely is dying out for this reason, it being manifestly impossible to expect that a stock body can be adapted for the transportation of, say, furniture and beer kegs, and that the vehicle will operate efficiently with either load. Special adaptions—reference being made only to body styles and not to the chassis of any single manufacturer, which advantageously can be made practically identical—are coming to the fore more than ever, which serves but to emphasize that it is more than ever the duty of the dealer on whom falls the brunt of the burden of keeping his purchasers satisfied, to see that his prospects' requirements are served when the truck is purchased.



GRABOWSKY ACCESSIBILITY

It may be a comparatively simple matter, of course, to judge of the type of body that will be most suitable, provided horsed equipment is to be replaced, for there then exists a basis upon which to build calculations. But where the venture is a new one the selection of body styles in all probability will be a more difficult one, and it may be proportional as the style of the truck chassis differs. That is to say, whereas it may entail no very great amount of study to evolve a type of body that will fit properly and permit the vehicle to be operated efficiently, provided the engine is located under the driver's seat or under the floor boards, the reverse may be so if the engine is placed forward under a hood after the manner of pleasure cars.

But not everything hinges on mere body style, though this factor probably has a more definite bearing on ultimate efficiency than generally is supposed. It is apparent, of course, that the chassis itself must be of a type that is suitable for the work which is to be performed, and in this respect, there has been and still is no little controversy regarding which of the several possible engine positions is the best. Superficially, it may appear inconsequential whether the engine is located up front under a hood or under the driver's seat or under the floor, though in reality it is of consequence and bears directly on the suitability of a vehicle for a certain service. Each position has its particular advantages, and it is essential that the dealer as well as the purchaser be acquainted with them in order that the former may be in a position intelligently to recommend a certain type of vehicle and that the latter may judge of the suitability the various chassis types for his business.



STERNBERG MOTOR UNDER SEAT

Of the two engine positions that have come into most general use, under the

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driver's seat and under a hood in front, the latter appears to be the favorite location, as is indicated by the following table, which lists some 252 vehicles representing practically every manufacturer of consequence. In explanation of the number of vehicles listed it should be pointed out that in several instances a single manufacturer produces trucks which are included under several capacity heads and that in other instances, manufacturers produce vehicles of both types.

Capacity.	Under Seat.	Under Hood.	Under Floor.	Under Body.	Total.
Under 1000 lbs..	3	15	2	4	24
1000-1500 lbs....	8	18	8	1	35
1500-2000 lbs....	8	22	5		35
3000 lbs.....	8	14	2		24
4000 lbs.....	15	20	3		38
5000-6000 lbs....	19	20	2		41
7000-8000 lbs....	11	4	1		16
9000-10,000 lbs...	17	10			27
Over 10,000 lbs..	8	3	1		12
Total	97	126	24	5	252

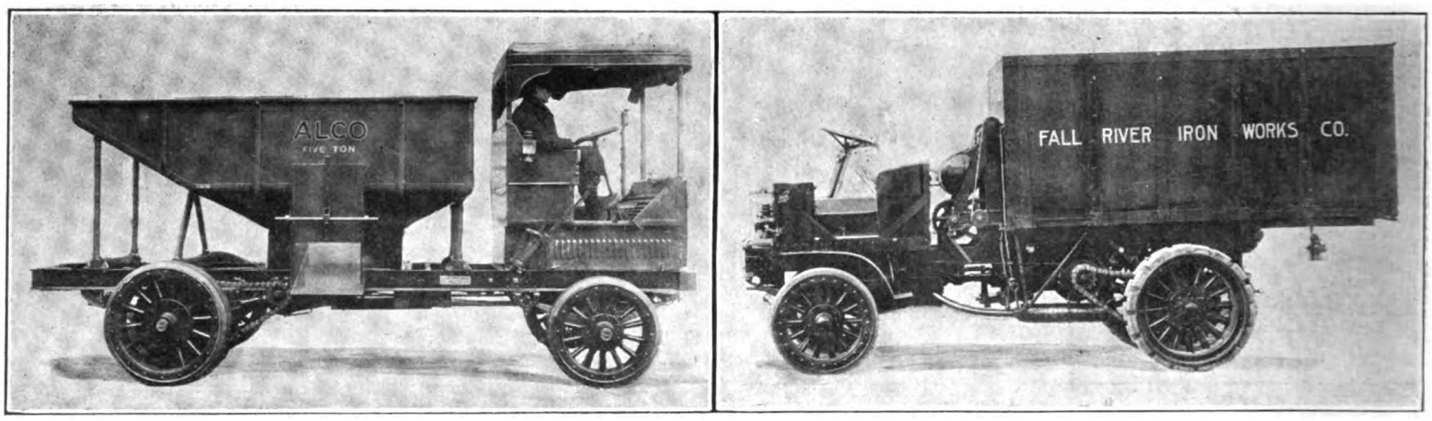
From the foregoing table it may be seen that for the lighter vehicles of from 1,000 pounds to three tons capacity the favored method of construction is to place the engine beneath a hood in front. In many respects there is logic in this arrangement, inasmuch as there is a minimum wheelbase length necessitated by requirements of stability, etc., and as the load capacity of the vehicle is light it would seem that there is little to be gained by placing the engine beneath the driver's seat. Of course, where the merchandise which is to be carried is bulky in character but light in weight slight advantage might be gained by placing the engine under the seat. However, the majority of the manufacturers whose products are rated at less than three tons capacity prefer to place their engines under a hood, from which it may be surmised that the location has not been chosen merely for esthetic reasons.

For vehicles of over three tons capacity, on the other hand, there is a very marked increase in the number of manufacturers who locate their engines beneath the driver's seat, a fact which is particularly noticeable in the vehicles that are rated at from four to five tons capacity. Of the 27 five-ton vehicles represented in the table only 10 have their engines located under a hood, as against 17 in which the engines are placed under the driver's seat, these two locations being the only ones, apparently, that are favored. The same preference is shown for vehicles that are rated at over five tons capacity, the exception being that a single manufacturer has placed his engine, which is of the twin-cylinder opposed type, beneath the floorboards. Of the total of 12 vehicles rated at more than 10,000 pounds capacity eight have their engines beneath the driver's seat and three have them under hoods in front. Taking into consideration all the vehicles represented in the table, 126 out of the 252, or 50 per cent., have their engines located under hoods, from which it may be judged that that position is, after all, the more favored.

Despite this fact however, each type of chassis has its particular advantages, as already has been pointed out, and experience has demonstrated that certain classes of work require that the engine be located under a hood and other classes require that the engine be located beneath the driver's seat. But even though a given class of work may not actually require a certain engine location, either location apparently being suitable, a slight study of the pros and cons of the two systems of construction often will serve to make plain which of these two types has even the slightest preponderence of suitability and serviceability in its favor and wherein its selection eventually will be of material benefit to the purchaser and to the manufacturer of the truck.

Of course, where the commercial vehicle is destined for use where the "going is good," as out in the open country, for instance, or in the smaller cities or towns where traffic is not as congested as it is in some of the large trade centers, the actual design of a truck chassis is of little moment, provided only that the engineering requirements have been fulfilled. It probably is true that a few years ago reasons that were purely esthetic in nature governed to a certain extent the external appearance of vehicles, and consequently their mechanical construction, but to the modern purchaser of truck equipment mere beauty of outline suggests nothing. There are those who take a just pride in the beautiful appearance of the vehicles in their extensive fleets, but such considerations have to do principally with body construction, where the painter may give full rein to his imagination. The actual design of a chassis which represents dollars and cents on the credit side of the ledger, however, governs construction as far as the purchaser of the vehicle is concerned.

It is needless to point out that in the design of any commercial vehicle there are a number of engineering necessities which cannot well be overlooked. For instance, it is the concensus of opinion among the better known truck manufacturers that it is essential that at least 60 per cent. of the total weight of the load be centered over the rear axle in order to insure positive traction under any and all conditions. Still there is no little controversy over this point, it being held by some that it is possible to distribute the weight more evenly over all four wheels, while others claim that for best all around results even more than 60 per cent. should be carried by the rear axle.



ALCO TRUCK IN WHICH MOTOR IS UNDER THE SEAT, AND KNOX "BETWEEN SEATS" CONSTRUCTION

Inasmuch as the type of vehicles in which the motor is placed under the driver's seat is particularly adaptable for the mounting of bodies in which more than 50 per cent. of the load is centered over the rear wheels, it is perhaps natural that exponents of this type of construction should advance as one of their principal arguments the necessity of greater weight aft. All things considered, there can be little doubt but that placing the major portion of the load over the rear axle tends to increase traction and, consequently, it decreases depreciation, for it is a fairly well established fact that idly spinning wheels, causing extensive wear in bearings and literally filing the tires off the rims, is one of the most prolific causes of big maintenance bills. Even aside from this consideration, which assuredly is not hypothetical, such construction as permits of the weight being approximately evenly distributed, as, for instance, when 60 per cent. is placed over

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the rear axle, has the additional advantage that the tendency to sideslip and skidding, born of wet pavements and the crowned roads which abound in the suburbs, is reduced. However, experience with some of the better known commercial vehicles in which the motor is placed forward under a hood, thereby placing practically all of the weight over the rear wheels, has served to demonstrate that the likelihood of skidding is not such as to wararnt the harboring of very great fears.

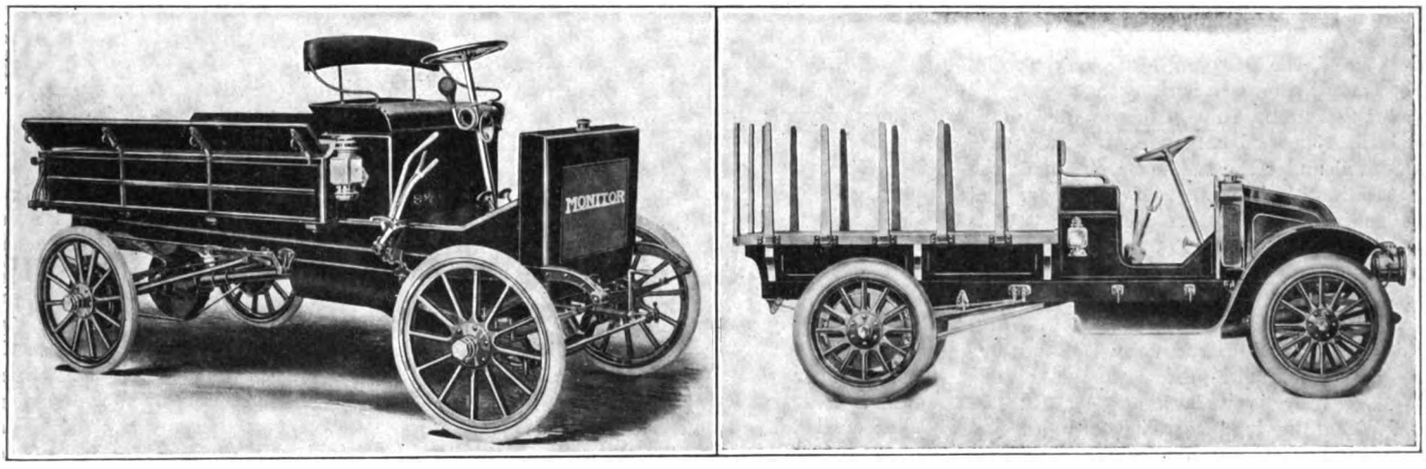
Although, as has been pointed out, the construction of vehicles that are designed for continuous use in outlying sections or for use in cities where little traffic congestion obtains makes very little difference in their efficient operation, it is practically essential that trucks designed for use in busy commercial centers be as short in overall length as possible. In this respect, it scarcely can be disputed that the under-the-seat type of chassis is of material advantage. For instance, in loading and unloading at the sides of streets, or at specially constructed loading platforms where at times a number of vehicles are loading, the overall length of trucks may have a very definite bearing on the transportation efficiency of the fleet. To those at all familiar with trucking in large centers, it will not be necessary to point out the comparatively common practice among teamsters of backing their vehicles to the curb and then swinging the team to one side or the other, thereby considerably decreasing the amount of space occupied by the vehicle; that is to say, the total overall length of the equipment can be shortened by approximately 50 per cent. by the simple expedient of turning the horses. With the motor truck, on the other hand, the overall length is fixed, and where traffic is congested, or even where it is not congested, and the streets on which the vehicle is loaded or unloaded are narrow, or, by reason of lack of space at terminal points the loading platforms of necessity must be placed close together, it is essential that the vehicle be as short overall as is possible.

Another advantage of the shorter wheelbase vehicle is that the operation of such a truck in traffic is easier; its driver can thread his way through trucking and "dodge" other vehicles with greater facility than can the operator of an inordinately long vehicle. Also, bearing directly on transportation efficiency, inasmuch as it tends to decrease the time of the truck on the road in service, the shorter vehicle can make turns more easily. Of course, it seldom is possible for the average commercial vehicles to turn completely around in the average streets in which they are used, such as obtain in New York City, for instance; almost invariably it is necessary for them to turn half way, back, and then complete the turn. Whereas a long vehicle might have to make two trips backward to the curb in order to make a turn, the shorter vehicle in all probability could be turned with but a single backward trip. Incidentally, it is comparatively easier for the operator of a short wheelbase vehicle to back his charge into an advantageous position at a loading platform, particularly where it is necessary for him to "ease" his way in between other vehicles which are close "packed" in order to economize on space.

Perhaps the principal advantage of the under-the-seat type of construction is that for a given wheelbase the maximum possible loading space is available. Obviously this effects economy of operation, which fact B. D. Gray, who is vice-president of the B. D. Gray Mfg. Co., of Amesbury, Mass., brought out in an illuminating manner in a short paper which recently was read before the Society of Automobile Engineers.

"In considering economy," he said, "one must take into account in addition to the actual cost of operation the space required for storing vehicles, and for loading and unloading. A 25 per cent. to 30 per cent. increase in the overall length of the vehicle for, say, a 12-foot loading space necessitated by the 'motor in front' type, is a serious disadvantage from this standpoint. It means that for storage room alone 25 to 30 per cent. greater space must be provided for the longer vehicle, to say nothing of the extra free space required for manipulating it in the garage, and the extra length of elevator required where the vehicle has to be lowered into the basement to be washed, and then taken up to one of the upper stories to be stored for the night, as is usually the case in large cities."

For the under-the-seat type of construction, Gray goes so far as to state as one of its advantages "less weight," but although there may be a slight reduction in weight by reason of the slightly smaller frame necessary, it is doubtful if the reduction is sufficient to warrant mentioning. Probably for the same reason—namely, smaller and lighter frame—Gray states that less power is required to operate a vehicle of this type and concludes his summation by adding that the "cost of maintenance in fuel, tires and bearings is less."



CONTRASTING CONSTRUCTION—MONITOR WITH MOTOR UNDER SEAT AND LIPPARD-STEWART UNDER HOOD

Among the better known manufacturers of the under-the-seat type of trucks is the Thomas B. Jeffery Co., of Kenosha, Wis., a picture of whose recently developed commercial vehicle is reproduced herewith. From it may be judged the comparatively large loading space which is available where the motor is placed partly beneath the driver's seat and partly beneath the footboards. One of the noticeable features is that the "overhang" is very slight.

In the illustration of the 5-ton Sampson truck which is reproduced herewith, there is depicted a slightly different method of constructing vehicles in which the motor is under the seat. In this case, the wheelbase is even shorter, though the available loading platform is approximately the same size. The driver, as may be seen, virtually is "perched on high," which position, it would seem, has an added advantage in that it permits him a practically unobstructed view of traffic both ahead and behind, the cab being high enough to raise him above the height of the material which is loaded.

Substantially the same construction is embodied in all of the Alco trucks, produced by the American Locomotive Co., of

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Providence, which company has been a most consistent exponent of this type of vehicle. From the accompanying illustration it may be judged that the distribution of the weight over the front and rear wheels is fairly even, though more than half of it is carried by the rear axle. Considering the load that may be carried on this particular vehicle, which has been designed specifically for the transportation of coal, it is apparent that the overall length has been reduced to the minimum, which feature in a coal truck is admirable, inasmuch as the truck may be expected to invade all kinds of localities where the unloading space may or may not be much more than is just sufficient for the purpose.

Where it is desirable to maintain the wheelbase at the minimum by placing the motor under the seat in front and to keep the driver as low as possible, the practice of placing the motor virtually between the two front seats and beneath a removable hood is a fairly common one, of which the Knox Automobile Co., of Springfield, Mass., and the Morgan Motor Truck Co. are among the better known exponents. Under this method many of the advantages of both types of construction—under the hood and under the seat—are obtained; the overall length is comparatively short and the engine and its parts are easily "getatable."

In the lighter forms of commercial vehicles of rated capacities up to four tons the favored position is under a hood in front, which is well illustrated by the accompanying table. The preference for this location readily is understandable. In the first place the load capacity is light, and it is a comparatively simple matter to provide loading space of sufficient size when the motor is placed forward, the wheelbase remaining constant and substantially one-third of its length being occupied by the motor and driver's seat. An excellent example of this type of construction is embodied in the Lippard-Stewart 1,500-pound delivery wagon which is illustrated herewith, the hood in this case being of the so-called French type, with the radiator located on the dashboard, where it is thoroughly protected. As an example of the other type of construction, the Monitor wagon, which is produced by the Monitor Automobile Works, of Janesville, Wis., is typical of the lighter forms of delivery wagons which within a comparatively short time have become a factor and which, in the opinion of not a few, are destined to become an even greater power in the not distant future.

Graphic illustration of the greater available loading space possible with the motor under the seat where the wheelbase and overall length remain practically constant is given in the accompanying illustration of the Federal chassis, in which the motor is under the hood, and the Sternberg chassis, in which it is positioned under the seat. In the former a considerable portion of the overall length is devoted to the driver and the engine, whereas in the latter this space is available for the body. However, it is impossible to judge a truck by the amount of the available loading space; there are too many other features which must be taken into consideration, and of these accessibility of parts, both of the motor and the transmission system, is of prime importance.

The trend of the automobile industry at present is all toward accessibility and simplicity, and although it has been advanced for the under-the-hood type truck that the accessibility which naturally follows this method of construction is one of its principal advantages, of which there can be no doubt, the reliability of motors and other parts has been brought to such a state of perfection that accessibility, though desirable, no longer is as necessary as it was a few years ago.

There can be little doubt but that with a motor located under the hood in front both it and the other mechanism, including ignition connections, gasolene and water lines and lubrication points, are instantly accessible, and even though there may be no necessity for touching these things, because of breakdowns, easy access for adjustment or overhauling is a feature which cannot well be overlooked.

The accessibility which is possible is well illustrated in the picture of the latest model Grabowsky truck, which is reproduced herewith. Raising the hood discloses the entire engine, and by reason of the distinctive construction of this particular vehicle the whole power plant, including the clutch and the gearset, may be removed intact. Other well known manufacturers of the type of vehicle in which the motor is placed forward under a hood are the Packard Motor Car Co., of Detroit, Mich., a picture of the Packard 5-ton truck being reproduced herewith; and the Driggs-Seabury Ordnance Corporation, of Sharon, Pa., which but recently has invaded the commercial vehicle field with a line of trucks bearing the name Vulcan. All the vehicles in the line have their motors forward under the hood, the chief characteristics being shown by the picture of the 4-ton truck which is reproduced herewith. Other well known manufacturers who have pinned their faith to the under-the-hood type of chassis are the Pierce-Arrow Motor Car Co., of Buffalo, N. Y.; the Peerless Motor Car Co., of Cleveland, O.; the F. B. Stearns Co., of the same city; the Walter Motor Truck Co., of New York City, and a number of others equally well known.

Although the accessibility which this type of construction permits is one of its greatest advantages, it is from the engineering standpoint that the construction appeals. As is shown by the accompanying illustration, it permits practically the whole load to be centered over the rear axle, thus permitting maximum tractive effort. Incidentally, with substantially the whole load carried on the rear axle, the load on the front axle remains to all intents and purposes constant, which feature reduces the difficulty of efficient spring suspension to the minimum. With the load on the front wheels known and constant, it is a comparatively simple matter to design springs which will permit of the proper degree of resiliency regardless of whether the truck is loaded or light. That this is a valuable feature may be judged by the fact that practically all of the parts which are most liable to injury because of the jars and jolts occasioned by the passage of vehicles over rough roads are located at the forward end of the chassis.

Another feature which this method of construction makes noticeable is that the effort required to turn the front wheels in steering the vehicle remains practically constant when the truck is loaded and when it is empty. In order to center the load over the rear axle, it is necessary, of course, to provide a type of body which overhangs to some little extent, and though this may be a slight disadvantage where a vehicle is used in congested traffic, it has the advantage that loading and unloading by means of the platforms which gradually are coming into more extended use is facilitated.

Taking all in all, it would seem that the advantages and disadvantages of both methods of construction balance fairly well. In a great many cases it will be quite possible to utilize either type of vehicle with economy and efficiency, though in an equal number of cases it will be necessary for the purchaser to study out the pros and cons of each system of construction before making a final selection. Even though it might appear to the casual observer that a certain type of truck is unsuitable for certain classes of work, such is not always the case, and it frequently is possible for the staff of service engineers which practically every manufacturer maintains for the guidance of purchasers to make such slight modifications in construction as will make either vehicle applicable to practically all classes of work. In cases of this kind, the selection of a vehicle quite naturally is a matter for the purchaser himself to decide. But inasmuch as it is the purpose of motor trucks to reduce transportation problems to terms of economy and efficiency, it is essential that the main points regarding the design of both types of vehicles be assimilated by the intending purchaser, provided his equipment may be expected to fulfill the requirements for which it is purchased.

Spark Gaps that Affect Throttling.

Not a little of the "inflexibility" of a motor where magneto ignition is employed is caused by the gradual widening of the plug gaps due to burning of the electrodes. The effect is a much weakened spark, which naturally precludes the possibility of much throttling. A similar result is evidenced where a supplementary gap is used with magneto ignition apparatus, however effective the device may be where battery and coil ignition is adhered to.

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PACKARD ADDS A "LITTLE SIX"

It Has 38-Horsepower Engine and an Electric Lighting and Starting System—Left Drive a Feature.

Following the line of progressiveness that was marked by the development and almost instant success of the six-cylinder 48-horsepower car which made its initial appearance late last fall, the Packard Motor Car Co., of Detroit, Mich., has added to its well-known line, which includes the two four-cylinder models—the "18" and the "30"—upon which the Packard reputation has been built, another six-cylinder car, which is styled the "38," the designation serving in this case, as it does in the others, to indicate the horsepower rating of the motor. Inasmuch as the new car has been designed primarily as a smaller and lighter edition of the older "48," and as the Packard features of design are of such nature as have proven themselves of genuine worth, it is but natural that the new "six" should reflect all the earmarks of quality that have served to distinguish Packard cars in the past.

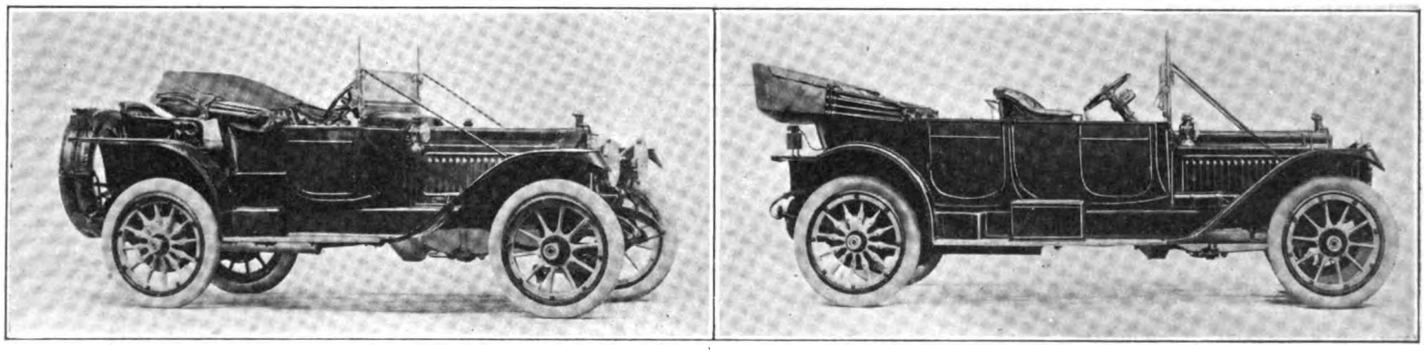
In bringing out the new model, however, day by day developments of the automobile industry at large have been carefully watched and given their full measure of attention, the concrete result being that the new car incorporates a number of features which heretofore have been foreign to Packard practice. Thus, for instance, in view of the well-defined tendency in this direction, left drive and control have been adopted as the logical construction and, by way of increasing the comforts of motoring to the maximum and reducing its labors to the minimum, a complete dynamo electric lighting and engine starting system forms one of its conspicuous features.

As might be expected, the line of bodies which is fitted to the new chassis is complete and includes all of the models which the Packard name has familiarized in the past. The prices of the various models, of course, are slightly lower than the prices of the larger "six," the difference being proportionate to the difference in size of the two models. The roadster, which is the smallest model listed, sells for $4,050, the standard five-passenger touring car and the phaeton, which may be constructed to accommodate either four or five passengers, listing at $4,150. The limousine and the landaulet sell for $5,200 and $5,300, respectively, the imperial limousine, which is a fully enclosed car, listing at $5,400; the brougham, coupe and imperial coupe models list at $5,200, $4,500 and $4,900, respectively.

In the design of the motor little room for improvement has been found possible, and for this reason the distinctive pair-cast L-head cylinders are retained, the valves all being located on the one side, where their enclosure by means of light metal covers is simple. The covers are readily removable in the event that valves require grinding or that adjustments need to be made. In conformity with Packard policy, the motor is of the real long stroke type, the bore being 4 inches and the stroke 5¼ inches. The nominal horsepower rating of the engine, therefore, is but 38, though by reason of careful design and exceptionally large valves and ports the actual power developed on brake test is 60 at 1,720 revolutions, from which it may be judged that the rated power is obtained at comparatively low crankshaft speed, a feature which long has distinguished the Packard products.

The lubrication system is identical with that which has been used with conspicuous success in the larger six-cylinder motor, the crankshaft, piston pin and connecting rod bearings being oiled under pressure. The cylinders and the camshaft and other minor bearings are oiled by splash from the crankcase, baffle plates being provided beneath the pistons to preclude the possibility of excess oil accumulating on the cylinder walls and causing smoke. By reason of the action of the auxiliary oiling system, the amount of oil delivered to the cylinders varies exactly as the speed of the motor, the oiling device being interconnected with the throttle lever. Ignition remains the same as it is in the "48," a high-tension magneto furnishing the requisite sparks. The engine is water cooled, the cooling medium being circulated by means of a centrifugal pump.

In adopting the electric lighting and engine starting system with which the new model is equipped, cognizance has been taken of the necessity for simplifying control mechanism to the greatest possible extent, and to this end the various starting, lighting and ignition switches have been located in an ingeniously contrived steering column switchboard which is the invention of H. B. Joy. The device, which is clearly discernible in the accompanying illustrations, is a small, semi-circular box-like structure that clamps to the steering column, thus bringing within easy grasp of the operator's fingers all the switches that are necessary to start the engine, to light the various lights in various combinations and to turn on or off the ignition current. As a further convenience, the auxiliary air valve lever, by means of which the carburetter may be adjusted, which in previous models has occupied a conspicuous position on the dash, also has been placed on the centralized switchboard.



PACKARD "LITTLE SIX" 38-HORSEPOWER ROADSTER AND FIVE-PASSENGER TOURING CAR

The generator, which forms the principal unit in the combined lighting and starting system and furnishes the current for lighting and starting, is mounted on the right side of the motor, the auxiliary equipment embracing a storage battery of liberal capacity and the usual automatic current control and cut-out switches. One of the noteworthy features of the electrical equipment is that all the wiring virtually is a part of the car, the wires being enclosed in flexible metal conduits which are attached to the chassis and not to the body proper. All the wires lead from a central junction box in the motor side of the dash, the necessity for trouble hunting in the event of derangements thus being reduced to the minimum.

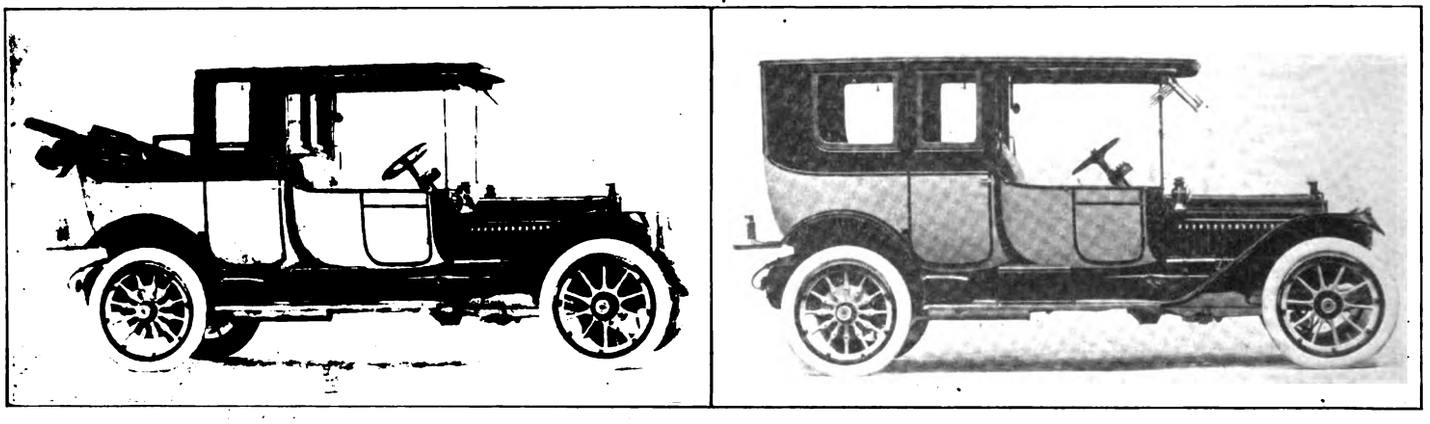
From the engine power is transmitted to the rear wheels through the intermediary of a dry multiple disk clutch, the design of which has not been altered in any way. It is contained in a housing securely bolted to the crankcase, making of the motor and clutch a single unit and thus precluding the possibility of the various shafts shifting out of line. The change gear mechanism is of the same semi-selective type that for a number of years has served as one of the principal distinguishing marks of Packard cars and provides three speeds

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forward and reverse. The whole mechanism is enclosed in a housing which serves also as an enclosure for the differential mechanism.

The steering gear is slightly different in construction from the gear that is used in the other Packard models, a worm and nut construction being employed. In it the worm and worm shaft are forged integral with the flange joint and the nut is provided with trunnioned disks which operate the yoke. The yoke and yoke shaft are forged integral with large, squared ends to receive the extra heavy special steel drop-forged steering lever. Except for this slight difference the new model is practically a duplicate on a slightly smaller scale of the "48"; the wheelbase is 115½ inches in the case of the roadster and 134 and 138 inches, respectively, for the touring car and the phaeton. The tires in each case are 36 x 4½, both front and rear, and the three-quarter elliptical spring suspension which was adopted by the Packard company for the newer series "48" cars is a feature of the new "six," and one which is calculated to enhance the easy riding qualities of the car, which is quite in keeping with the Packard policy.

Although Packard bodies always have stood for all that is right and proper in construction and have reflected very nearly the acme of perfection as regards easy riding qualities and comfort, the bodies on the new "six" have been brought to an even higher state of perfection by judicious paring of angles and general refinement. The lines are fine and they blend nicely with the dash and the engine hood. One noticeable difference between the new bodies and the old is that in the former but a single front door is furnished the panel on the left side extending in an unbroken line for the full length of the front compartment. The standard equipment which is included with all the open types of bodies embraces among other things a top with slip cover and a Packard folding windshield. The limousine and landaulet bodies are equipped with two extra drop seats which face to the rear, and which increase the capacity of these two types to seven passengers.



NEW PACKARD LANDAULET AND LIMOUSINE TYPES ON "LITTLE SIX" 38-HORSEPOWER CHASSIS

BLACKSMITHING BY ELECTRICITY

How Heat for Welding Is Electrically Generated—Sizzling Arcs That Fuse Metal To Fill Defective Castings.

Like many other mechanical processes of comparatively recent development, electric welding seems to be more or less shrouded in mystery, so far as the non-technical public is concerned. As a matter of fact, however, the fundamental principles that govern the use of electricity in joining together metal parts are extremely simple, though the apparatus required for the actual process is rather complex.

Every conductor of electricity offers resistance to the passage of the mysterious fluid; some substances offer more resistance than others. If a current is passed through a conductor that offers considerable resistance, heat will be generated in proportion to the degree of resistance and the strength of the current. The greater the volume of the current the higher the resistance will be for a conductor of a given material and size. Therefore, if a current is passed through a wire that is too small to carry it, the wire will heat. Any conductor can be heated by overloading it. This is the principle that is applied in electric welding. Two pieces of iron or steel are made the terminals of a dynamo which generates a heavy current at very low voltage. When the ends are placed together the current will flow from one to the other, but the resistance at the point of contact will be so great that the metal will rapidly heat and the two pieces fuse together without any necessity for hammering or pressing and without flame, dirt or ashes to interfere with the perfect union. As the resistance is greatest at the point of contact, the heat will be localized there, avoiding unnecessary heating of the rest of the metal and economizing current.

Electricity is applied to the heating of metal in another way that, while somewhat similar to the welding process, is different in most respects. Instead of using the heat generated by the resistance of the metal itself, the heat of the electric arc is made to do the work. The arc process is useful, among other things, for filling holes in steel and other castings. The casting operated upon is made one terminal of the source of current by being connected to the positive wire from the dynamo, while the negative wire terminates in a rod of carbon. The operator, who has to be carefully protected by a headgear with colored glass goggles, and wears heavy gauntlets, touches the carbon on the casting at the point where the filling is to be done, and then draws it away. The current follows the carbon, jumping across the air gap and generating a heat so intense that the metal soon begins to melt at the point where the arcing occurs. As soon as the melting point is reached a rod of iron is held in the hot spot and melted into the hole until the cavity has been filled completely; the filling welds itself to the walls of the cavity and makes a repair that is about 75 per cent. as strong as the solid casting. If the walls of the hole are scaly and incapable of uniting properly with the filling metal, the casting is turned over and the arc applied to the walls of the hole until the impurities are melted away, when the casting is righted and the filling proceeded with.

The operator has to exercise extreme care in protecting his skin from the glare of the arc. Failure to do this will result in a sort of burning wherever the light reaches the skin; the injury is something akin to a sunburn and its consequences are extremely unpleasant, to say the least.

To Extinguish Fire in Gas Tank

If the gasolene vapor from a tank catches fire at the open filling cap, it can be extinguished almost instantly by covering the hole and preventing the escape of any more gas to feed the flame. The rich gas in the tank is quite difficult to ignite, but upon mixing with a little air it burns readily. A cap, a piece of cloth or a handful of waste will do the trick in a jiffy, but no time should be lost in obtaining such articles, for if the hand is placed over the opening it will answer just as well.

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NYBERG DEVELOPS NEW MODELS

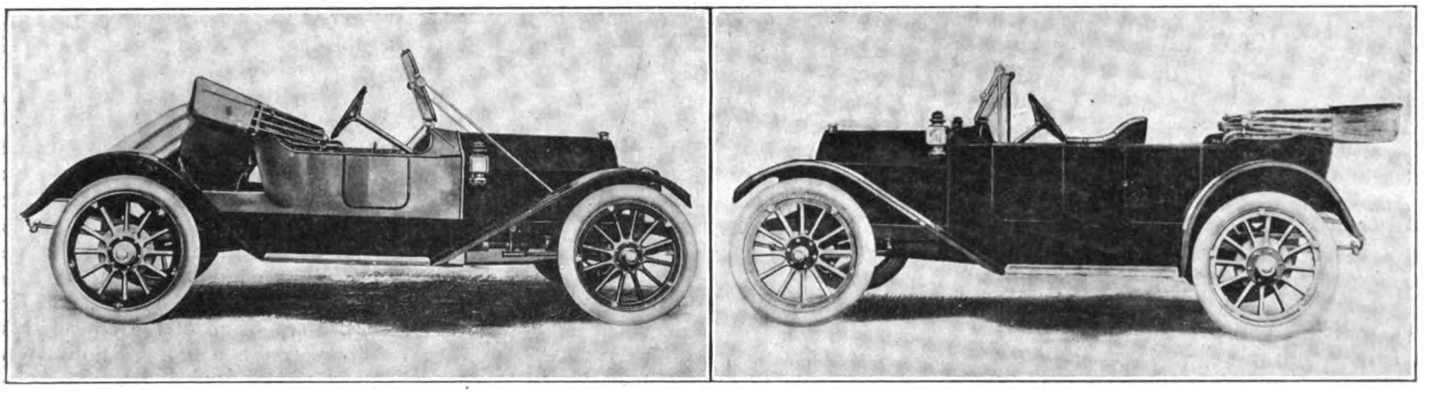
One Is a Moderate-Powered "Six" and the Other Is a "Four"—Center Control for All a Feature.

As the leader in the Nyberg line, the producer of which is the Nyberg Automobile Works of Anderson, Ind., there is a brand new six-cylinder model which is smaller than the standard 60-horsepower "six" that has borne the Nyberg name-plate in the past, and which is designed primarily as a moderate-priced vehicle incorporating all of the many earmarks that have served to distinguish its predecessors. As has been indicated, the 60-horsepower six-cylinder model that has given such a good account of itself in the past is continued with but one significant alteration. The engine dimensions have been increased from 4⅛ x 5¼ to 4¼ x 5¼, permitting the realization of slightly more power, though the rating remains the same.

Of the other two cars that round out the line, both of them being four-cylinder models, the larger, which last year was rated at 42 horsepower, now is rated at 40 horsepower, despite the fact that the same alteration in engine size has been made as obtains in the case of the larger six. The smaller four-cylinder model, which is known as the "four-37," has a new motor of the long stroke type, the bore and stroke being 3¾ x 5¼, this motor and all the others being of the well-known Rutenber make. Except for the engine changes that have been mentioned, all the cars in the line remain substantially the same, notation of the fact that detail refinements and minor improvments have been made being unnecessary, in view of the policy of the manufacturer to maintain a high standard of merit by retaining carefully revised and well-tried features.

Due to the newness of the smaller six-cylinder model, it is natural that greater attention should be directed toward it, though there is nothing radical or untried in its make-up, which follows closely the construction which has been instrumental in building up the Nyberg reputation. As a matter of fact, it is virtually a reproduction on a smaller scale of the 60-horsepower model, and as the construction of all the cars in the line is exactly similar, except for a proportionate difference in the size of the parts, one description will suffice for all. The motor in the new "six" is rated at 45 horsepower, the cylinder dimensions being 3¾ bore and 5 inches stroke. In each case motor, clutch and change gear mechanism form a rigid unit which is supported in the chassis frame at three points. The clutch is of the multiple disk variety, the alternate disks being faced with Raybestos; change gear mechanisms in each case are of the selectively operated type and provide three speeds forward and reverse. Rear axles are of the full-floating type and the drive is transmitted through two Spicer universal joints which are enclosed and operate in an oil bath. Both of the six-cylinder motors are fitted with starting devices. The wheelbases of the four models are 134 inches for the "6-60" and the "6-45," 126 inches for the "4-40" and 1-16 inches for the "4-37."

Including equipment, which embraces demountable rims, the usual complement of lamps, gas tank, tools, jack, horn, pump and tire repair kit, the new "six" lists at $1,750, the larger six-cylinder model selling for $2,000. The price of the 40-horsepower four-cylinder model, which is $1,450, includes the same equipment, though the "37," which lists at $1,295, carries with it, in addition, a top and a windshield.



TWO NEW NYBERG MODELS—SIX-CYLINDER ROADSTER AND FOUR-CYLINDER FIVE-PASSENGER TOURING CAR

Wholesale Arrests in Cleveland.

Although Chief of Police Kohler of Cleveland, O., brought a storm of protest upon his head when he issued orders last week that every violator of the traffic law was to be arrested, and although automobile interests threatened to take measures against him, his stern handling of the situation appears to have accomplished results, if the number of arrests daily is to be accepted as an indication. From the police standpoint the town had gone beyond the limit in its ignoring of the traffic rules, and open mufflers, smoking exhausts and other violations were the rule rather than the exception. When Kohler sent out his order, 450 motorists were arrested the first day, and of these 110 were taken to station houses and "booked." He persisted in haling the violators into court, despite public indignation, and now the arrests have dwindled to 30 or less, and only about one-third of these violations are considered sufficiently offending to warrant the violators' being held for court.

New Clubs and Club Elections.

The Hastings Automobile Club has been formed in the Minnesota town of that name. The following are the officers: President, E. C. Anthony; vice-president, Dr. A. M. Adsit; secretary, A. N. Gergen; treasurer, John Heiner.

At the annual election of officers of the Norwood (Ohio) Automobile Club, Bush Parker was elected president. The other officers are: Vice-president, P. Cadwaller; secretary, L. P. Hopkins; treasurer, Dr. H. Cadwallader.

At a meeting which resulted in the formation of the Windom (Minn.) Automobile Club, R. D. Collins was chosen to head the organization. The other officers are as follows: Vice-president, L. Sagge; secretary, T. A. Perkens; treasurer, H. E. Hanson.

E. C. Smith has been elected president of the Greely Motor Club, of Denver, Colo. The other officers who recently were elected are: Vice-president, S. M. Edgall; secretary-treasurer, C. A. Fitch.

At the annual election of officers of the Beresford (S. D.) Automobile Club, the following officers were elected: President, J. W. Reedy; vice-president, O. Ofstad; secretary, Dr. J. S. Opland; treasurer, J. T. Scroggs.

The Ellsworth County Automobile Association has been formed at Junction City, Kan. The officers are: President, C. F. Pohlman; vice-president, William Schermerhorn; secretary, Bert L. Baker; treasurer, William Moore.

Stove Cement for Cracked Jackets.

There are several kinds of cement sold for mending stoves that are very useful for making temporary repairs in case of a cracked water jacket. In some cases a cracked jacket repaired with cement of this sort will last for years without leaking.

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THREE PISTONS VS. FOUR CYLINDERS

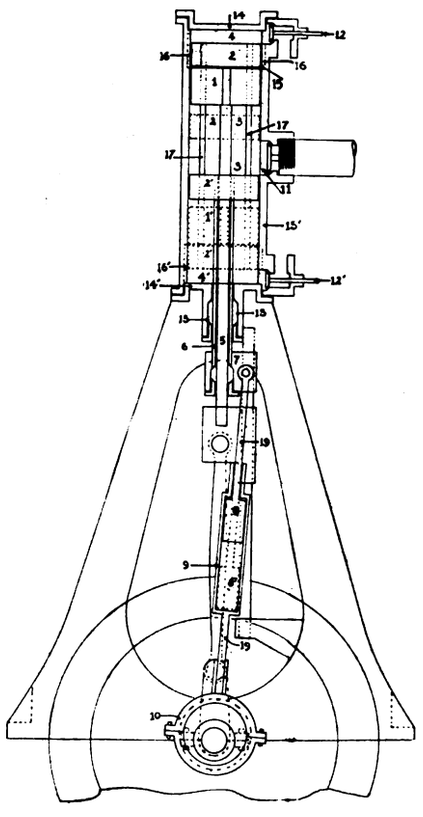
Much Be-pistoned Motor in Which Something is Happening All the Time—Unheard-of Efficiency Claimed.

As a rule the outward appearance of a gasolene motor is more or less indicative of what is to be found within, so that some idea of the inner workings can be gleaned from an inspection of the exterior. In the case of the Gile engine, shown in the accompanying illustration, however, there is little or nothing in the appearance of its single cylinder to indicate that it is anything but a motor of more or less unusual design, operating on one of the conventional cycles. An inspection of the accompanying illustration, however, will reveal the fact that the engine is designed to embody in a single cylinder the functions of all four cylinders of the usual four-cycle engine; that is to say, it produces—or is intended to produce—four times as many explosions per revolution as a single four-cycle cylinder, or an explosion every half revolution, and, in addition, scavenges the combustion chambers of dead gas at the end of each exhaust stroke.

The claims that are made for the engine by the Gile Motor Company, Inc., of Boston, are so broad that in order to justify them the motor must be capable of showing an efficiency considerably in excess of that of any of the more familiar machines. The inventor states, however, that the motor is fully equal to the somewhat amazing task, and the mere fact that a company has been organized to exploit the engine would seem to indicate that, broad as are the claims made, there doubtless is more in the motor to merit them than a casual inspection would reveal, and this statement may be said to apply both to its ability and construction.

The most radical feature of the Gile engine is its triple piston and the mechanism which controls the movements of the two auxiliary pistons. In the drawing, 1 is the main piston and 5 the connecting rod, which passes through a stuffing box and imparts motion to a cross head; 2 and 2^1 are the auxiliary pistons rigidly connected by meanse of steel rods, 17, which are free to slide through holes in the main piston. The lower auxiliary piston, 2^1, carries a tubular piston rod, 6, which is an easy working fit over the main piston rod, 5. The lower end of the tubular piston rod is attached to a crosshead, 7, which is connected to the eccentric, 10, by means of the rod, 19. The continuity of this rod is interrupted by a dashpot arrangement, consisting of a cylinder, 9, in which is a piston, 8, the piston attached to the upper end and the cylinder to the lower end of the rod. By virtue of this mechanism the main piston moves in unison with the crank, in the usual way, while the auxiliary pistons, moving as one, are controlled to some extent by the eccentric, but are capable of independent motion within the limits prescribed by the dashpot, which checks the tendency of the pistons to move too far at the ends of the strokes and so come into contact with the cylinder heads.

In the cylinder are three valves; two, 12 and 12^1, are exhaust valves, and are mechanically operated by means not shown, and the third, 11, is an intake valve, of the automatic type. It will be understood, of course, that the illustration is in the nature of a diagram setting forth the principle of



GILE MOTOR IN SECTION

operation, rather than a drawing of the actual working motor, which doubtless differs from the drawing in various details.

The functions of the motor overlap somewhat, and the peculiar piston action is extremely interesting, to say the least. In order to follow the cycle, it must be assumed that the space, 3, between the main piston and the auxiliary piston, 2^1, is filled with combustible gas—a full charge. In compression chamber 4, above auxiliary pistno 2, there is another charge of combustible gas, compressed and ready for the igniting spark. Exhaust valve 12^1 just has opened and the burned gas under auxiliary piston 2^1 is passing out. Ignition occurs and the three pistons descend, the upper auxiliary piston resting on the top of the main piston and the lower auxiliary piston driving out the dead gas in the lower space. The charge in space 3 travels along with the rest of the outfit. Auxiliary piston 2^1 reaches the bottom of the cylinder long before the crank finishes the downward movement, and just as it is on the point of coming down on the bottom of the cylinder with a bang, the eccentric, 10, stops the downward movement of the compound eccentric rod and the dashpot brings up the auxiliary piston, just in time.

The adjustment is so nicely made that the space between the auxiliary piston and the end of the cylinder is next to nothing, and there is practically no dead gas left. Meantime, however, the main piston, 1, is continuing its downward stroke under the pull of the crank,, and as the auxiliary can descend no lower, the space 3 contracts and the gas in it is forced through a series of flutes, 16^1, into the space at the bottom of the cylinder, the auxiliary piston rising sufficiently to accommodate the gas but being prevented from rising too far by the fact that the piston 8 is at the top of its dashpot. Of course the exhaust valve 12^1 is closed. The charge in space 4^1 now is ready for ignition and the main piston 1 is close to auxiliary piston 2^1. While the space between piston 1 and auxiliary 2^1 was closing on the down stroke, the space between the main piston and auxiliary 2 above it of course was opening, creating a partial vacuum, which caused the automatic intake, 11, to open and allow fresh gas to rush in; the inspiration of gas commences as soon as the main piston passes the supply port. The conditions now are exactly similar to those which existed at the beginning of the stroke, except that the positions are reversed, and everything is in readiness for the upward stroke, which is, of course, a repetition of the down stroke, so far as the method of operation is concerned.

In addition to producing two explosions per cylinder per revolution and scavenging the combustion chambers, the Gile motor, according to the inventor, mixes its gas with exceeding thoroughness during its forced passage through the fluted portways 16 and 16^1, with the result that combustion is extremely satisfactory. Also, remarkable efficiency is claimed, though cylinder dimensions and horsepower outputs are not given, so that it is not possible to institute comparisons; however, in the words of the inventor, Fred H. Gile, who also is president of the Gile Motor Co., "four times as many explosions of a given power each must give at least four times as much power. If all the charge is burned up, then the usual waste of 75%, more or less, must be largely saved. If there is no fire or heat at the exhaust, and very little heat from jacket, then the charge must be burned up. And so on. It seems almost too simple." It would seem, also, that the motor runs as silently as an ordinary steam engine, even without a muffler, for when the exhaust gas issues there are "no appreciable exhaust products and no explosive force to the exhaust. . . . . The force of the exhaust is very slight, not two pounds per square inch, which seems to point to the formation of a vacuum in the cylinder after burning the charge out."

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BUICK REVISED AND RENUMBERED

Three Models Dropped and One Added, Making Five in All—Mechanical Construction Practically Unaltered.

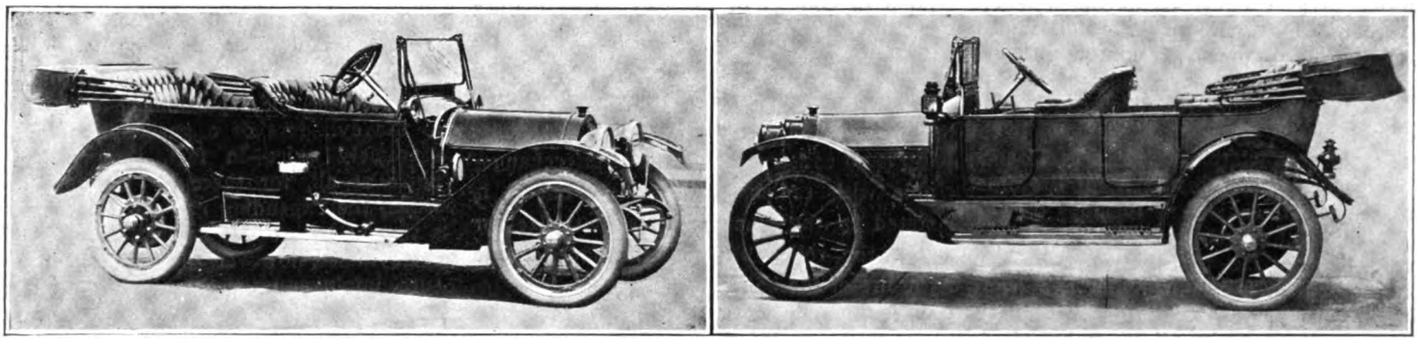
In the course of the annual overhauling of its line of cars in preparation for a new year's business, the Buick Motor Car Co., of Flint, Mich., has made a number of changes which, it goes without saying, are all in the nature of improvements; none is in any way radical or sensational. Though one new model has been added, the total number of models has been reduced from seven to five. There is a tendency toward longer wheelbases, bigger tires, better and more complete equipment, roomier and more luxurious body work and, generally, closer attention to the many details that, when rightly worked out, make the purchaser feel that his money was well spent; but as for innovations, or mechanical changes of any kind, there are none at all. The reliable Buick motor, with its overhead valve gear, is just the same, and all the other mechanical features that have helped to make the Buick reputation what it is are retained intact. Included in the equipment of all Buicks of the new vintage are Disco acetylene motor starters—an addition that certainly will detract nothing from the popularity of the line.

Although it is known that the Buick company, in common with several other equally well known manufacturers, actively is preparing to market a "six," which already is so far advanced as to have led to expectations for its inclusion in the present line, no mention whatever is made of it and it is not divulged just when the car will make its formal debut.

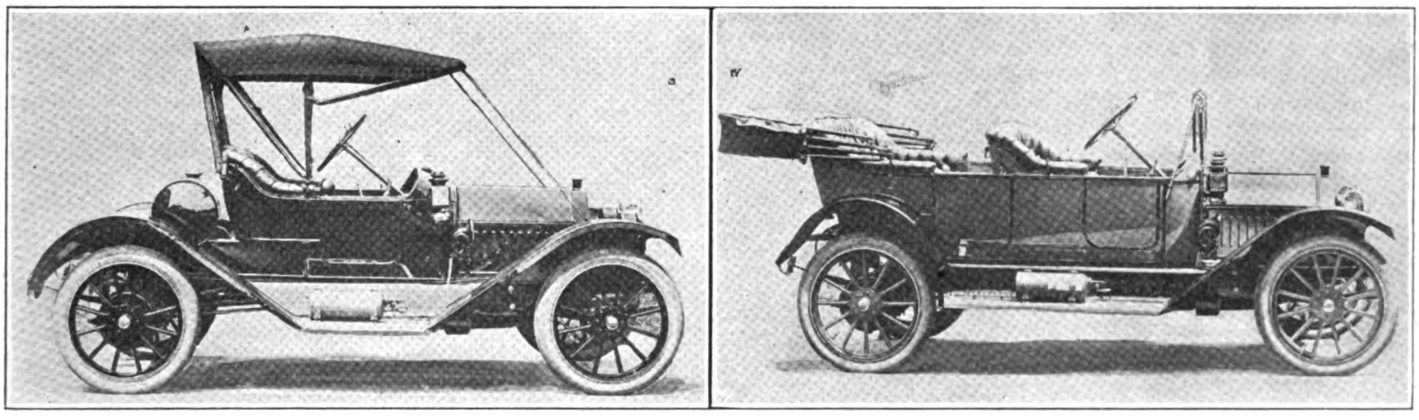
To begin with, there has been a rather sweeping revision of the numbers by which the various models are designated. Heretofore the numerals employed have borne no particular relation to the places of the cars in the list—for instance, a small car might have a higher number than a bigger machine. Now, however, the bigger the number the bigger the car, is the order. The new model numbers are 24, 25, 30, 31 and 40; the first four are continuations of the old models 36, 35, 28 and 29, while 40 is a new model in that it has a new number, a motor of a size that is new in the Buick catalogue—the cylinders measure 4¼ x 4½ inches—and the price is new. Mechanically, model 40 is identical with other Buicks in every way. The numbers that have been dropped are 14, 34 and 43; the first is the little two-cylinder runabout—the last Buick of the type that originally made the name notable—which has been discontinued, the second is a runabout very similar to the old model 36 and to the new model 24, and the third, model 43, is a bigger car than any of the new models, having a wheelbase of 116 inches as against the 115 inches of the biggest of the new models, a motor of 4½ inches bore and 5 inches stroke as against the 4¼ x 4½ of the new big car, and a price higher by $150 than the present highest priced Buick, which lists at $1,650.

The new member of the Buick family, model 40, is a really handsome five-passenger touring car with 40 horsepower motor; in common with all the other new models it has a leather-faced cone clutch, three-speed selectively controlled gearset and shaft drive. The wheelbase is 115 inches and the tread standard—56 inches, or, for Southern use, 60 inches. The wheels are 36 inches in diameter with 4-inch tires on demountable rims. The equipment included in the price of $1,650 is very complete and consists of combination oil and electric side and tail lamps, electric headlights, generator for supplying current to the electric lamps, the usual horn, tools, etc., robe and foot rails, cocoa tonneau mat, spare demountable rim, tire irons, Disco starter, mohair top and cover, clear-vision windshield with short stay rods and Prest-O-Lite tank.

Model 31, the next smaller size, is a five-passenger touring car listing at $1,285. As compared with model 29, which it succeeds, the only change, apart from the new features common to all new Buicks, consists in making the seat in the tonneau a little wider and, consequently, more comfortable when the full complement of passengers is on board. The wheelbase is 108 inches, the tires 34 x 4, and the motor, which has a bore and stroke of 4 x 4 inches, is rated at 32 horsepower. The equipment is similar to that of the bigger car, except that the electric headlights are replaced by gas



NEW 40-HORSEPOWER MODEL BUICK AND THE 32-HORSEPOWER TOURING CAR



BUICK ROADSTER AND FIVE-PASSENGER TOURING BODIES MOUNTED ON 28-HORSEPOWER CHASSIS

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lamps and there is no dynamo; a 6-volt 60-ampere storage battery supplies current for the side and tail lamps.

Model 30 is the largest of the two runabouts that grace the new Buick line, and is mounted on the same chassis as touring car model 31 and carries the same equipment. The tires are 3½ inches, owing to the lighter body and smaller load capacity. A cylindrical gasolene tank is carried back of the seat and contains 23 gallons. The price is $1,125. The smallest of the Buick touring cars is model 25, having a wheelbase of 105 inches, 32-inch wheels, 3½-inch tires and a 28-horsepower motor with cylinders 4 x 4 inches bore and stroke. The body is considerably roomier than that of its predecessor, model 35, particularly in the matter of seat width, and the wheelbase is three inches longer than that of the older car. Standard equipment includes oil side and tail lamps and gas headlights with Prest-O-Lite tank, tools, horn, robe rail, top, top cover, windshield and tire irons. Model 25 lists at $1,050.

With a smart straight-line runabout body the chassis which carries the little touring car becomes model 24, the smallest of the Buicks. Mechanically, the specifications are identical with those of the touring car. The wheelbase is 3 inches longer than model 36, the former number, and the seat is wider, while the box at the rear has been altered in design so that a suitcase can be strapped on top if necessary. The equipment is about the same as that of model 25, omitting, however, the gas headlights and the rails required for the touring car. The price, $950, marks the low limit in the present line of Buick cars.

Among the little refinements that are noticeable in all the new models is the use of black and nickel for lamps and other metal trimmings. There will be no polished brass on any of the new Buicks. Just at the place where the toes of passengers' shoes come in contact with the body, at the back of the running board, there are metal "scuff-plates" which take the wear and do not show it as do paint and varnish. All equipment is standard and included in the regular price, and no cars are sold without the full quota of "extras."

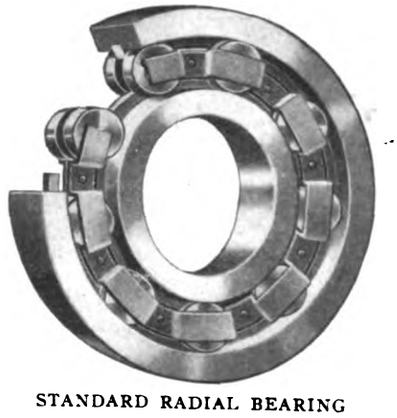
"Storage Battery" as a Misnomer.

Though the term "storage battery" seems to indicate that the battery contains electricity, just as a tank contains water, nothing could be further from the truth. A storage battery contains no more electricity than a potato. When current is turned into it in charging, certain chemical changes take place in the plates, and when the charging wires are disconnected and the battery terminals connected, the chemical substances immediately commence to return to their original condition, and in so doing they generate almost as much electricity as was passed through in the charging process. The difference between the input and the output is approximately 15 per cent.

STANDARD DEVELOPS NEW BEARING

Balls or Rollers Useable in New Product of Philadelphia Company—Is Designed for Radial Service.

One of the most important advantages claimed for roller bearings by their manufacturers is that the line of contact given by the roller is conducive to longer life, for a bearing of a given size, than the point of contact of the ball. This feature is emphasized by the Standard Roller Bearing Co., of Philadelphia, Pa., in bringing out a new radial roller bearing, shown in the accompanying illustration. The housing is so constructed that it is interchangeable with radial ball bearings, but it is stated by the manufacturers that, size for size, the roller bearing will have double the life of the ball bearing.



STANDARD RADIAL BEARING

The short cylindrical rollers employed are spaced by means of a cage, and their lateral movement on the races is prevented by means of ribs or flanges projecting from the races and entering annual grooves formed in the rollers. The new bearing is designed especially for hard service, and may be used on crankshafts, for instance, with satisfactory results. It is purely a radial bearing, and while it will sustain a small amount of end thrust, it is not intended for such service.

To Convert Reading of Hydrometers.

The hydrometers that are in common use for testing the density of gasolene are graduated according to Baume's scale, which is entirely arbitrary. Some hydrometers are graduated to give specific gravity, and it may be desirable, if one kind of a hydrometer is used, to be able to convert the reading to terms of the other scale. If a reading is taken with a Baume hydrometer it may be changed to read in terms of specific gravity by the following formula:

$$\frac{140}{130 + B} = S$$

If the reading has been taken in terms of specific gravity it can be converted to Baume by the following:

$$\frac{140}{S} - 130 = B$$

In both of which S = specific gravity and B = Baume's scale. In using a hydrometer care should be taken not to allow the instrument to touch the walls of the vessel containing the liquid under test, for the tendency of the surfaces to stick together slightly will interfere with accuracy.

"Explosion" not What Word Indicates.

Though the very word "explosion" would seem to indicate the production of loud and sudden noise, the explosions that take place in the cylinders of a gasolene motor are extremely quiet—in fact, they make no noise at all, for there is nothing upon which the expanding gas can react in such a way as to produce sound. After leaving the cylinder, however, the gas, at high pressure, impinges upon the air, if the exhaust is unmuffled, and by its impact upon the atmosphere makes the racket that has upset the equanimity of innumerable peace-loving individuals and has been the direct cause of legislation against muffler cut-outs. It is noticeable in a motor with a very efficient muffler that the air can be heard passing through the carburetter, the timing gears may be audible and other parts of the mechanism may produce their slight characteristic sounds; but never a sound issues from the combustion chambers in which the so-called explosions are taking place in rapid succession.

Pistons That Compensate for Altitude.

Just what effect altitude has on the operation of a motor readily can be understood when it is stated that with a motor of constant compression ratio the power developed varies directly as the barometric pressure. That is, if a motor which will develop 10 horsepower in a location where the barometric pressure is 14 pounds to the square inch is removed to a higher altitude where the atmospheric pressure is but 12 pounds, the power developed will be but 8.57 horsepower Cognizance is taken of this effect of pressure on the operation of a motor by many makers, and especially by those who devote their entire efforts to the production of trucks. The International Motor Truck Co., for instance, decreases the compression ratio of the cylinders of motors which are intended for use in localities remote from the sea level. This is done by "doming" the piston heads, which has the effect of increasing the compression.

Lubrication that Causes Misfiring.

One of the reasons why manufacturers of magnetos are rather particular in their instructions not to use an excess of oil is that if the lubricant finds its way to the platinum contact points trouble is sure to follow, for the points will burn and the motor will miss fire until the offending oil has been removed and the points dressed.

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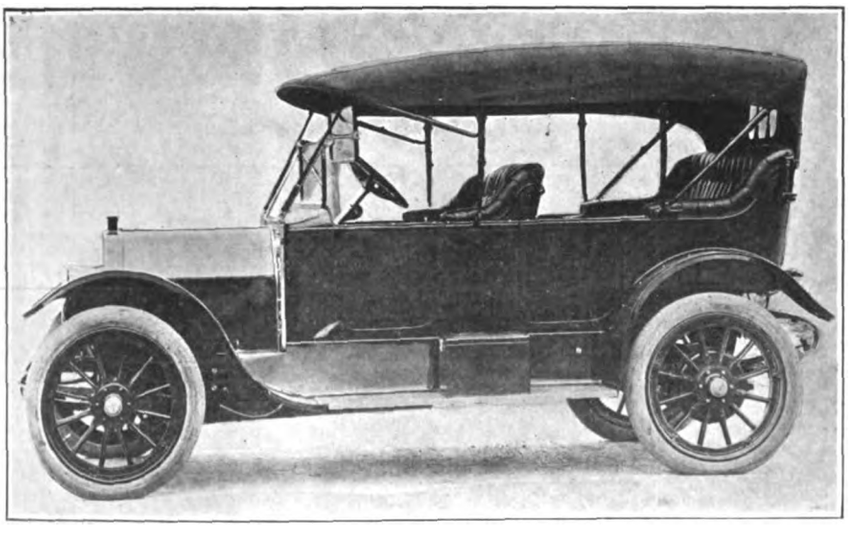
HAYNES ADOPTS ELECTRIC STARTER

Also Complete Dynamo Electric Lighting System—Other Alterations Which Affect Comfort and Equipment.

It has been a long time since radical changes were made in the chassis of the cars manufactured by the Haynes Automobile Co., of Kokomo, Ind. Dimensions have been changed, to be sure, and there have been many little alterations that were in keeping with the trend of the times, and in the matter of body building the Haynes cars have held their own, to say the least. But the cardinal Haynes principles of construction have a way of persisting through sheer force of merit. And in looking over the model 21 chassis—the standard Haynes of 1912—with a view to taking advantage of past experience in preparing model 22, the latest creation of the Haynes factory, the engineers decided that the coming year was to be no exception to the rule—the car was good enough to stand as it was, with the inevitable detail improvements and additions that come with each year. So it comes about that those who knew the Haynes of last season will have no difficulty in recognizing its successor.

The most important difference between the new model and its predecessor lies in the fact that an electrically operated motor starting device has been added, which accounts for the fact that the front end of the car no longer is decorated with that very dubious piece of ornamentation, the starting crank. The Haynes starting device, broadly speaking, is divided into three principal parts—the dynamo that generates the current, the battery in which the electricity is stored and the motor which, drawing current from the battery, starts the engine. Incidentally, the dynamo and battery also supply the current employed in the electric lighting system of the car.

The dynamo, on the right side of the engine, is driven from the intake valve camshaft and is of the completely enclosed type, so that it is unaffected by dust and rain; even the driving mechanism is protected. Two wires from the generator lead to the storage battery on the opposite side of the car, on the running-board, first passing through an automatic cut-out on the dashboard—a device for automatically opening the circuit when the generator speed is so low that the pressure on the battery side is equal to that on the generator side; this prevents the battery from discharging itself through the generator when the machine is not generating, and it also cuts off the current when the battery is fully charged.

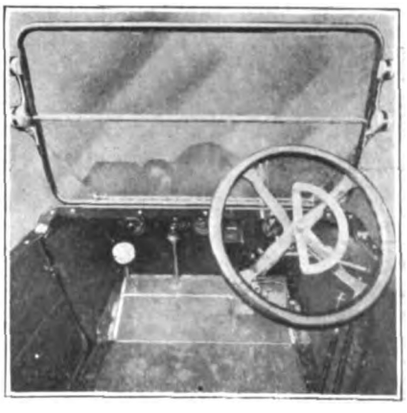


NEWEST HAYNES, WHICH IS ELECTRICALLY LIGHTED AND STARTED

The starting motor is on the left side, below the frame, and drives through a double reduction gearing to a gear cut in the rim of the flywheel. Two wires run from the battery to the motor, passing through the service switch, which is mounted on the main frame of the car, quite close to the battery. The starting apparatus is controlled by a dashboard switch and by the speed changing lever, the quadrant for which is made with a special slot for starting. The slot ordinarily is closed by a plate, which is shifted by pressure on a foot button, when the lever can be brought into the starting slot and pushed forward, which meshes the gears and starts the motor. As soon as the engine starts the lever is automatically released, springs back to neutral position and the starting slot is closed. Thus the starting motor cannot be connected to the engine while the transmission gears are meshed for the simple reason that in order to throw the starting motor into gear the lever must be brought to neutral position. The Haynes company has been working on this starting device for a long time; it was completed some six months ago, and in the intervening time has been tried out so severely and so satisfactorily that it is believed to be good enough to put into the car as standard equipment—which, from the Haynes point of view, is the last word of approbation.

Apart from the motor starter, the new things on the new Haynes are of comparatively small moment, mechanically, though in the aggregate they add very considerably to the comfort—or, rather, to the luxury—of the car. For instance, the upholstery in the rear seat is no less than 12 inches thick, with the back and sides in proportion; the rear springs are six inches longer than in model 21, being 48 inches in length, while the front springs, though unchanged at 40 inches long, are made easier by being considerably flattened, this being permitted by a two-inch drop in the front ends of the spring hangers. Body-work now is of steel instead of wood, as formerly.

A few mechanical details have been altered with a view to obtaining greater reliability and freedom from the possibility of trouble. For instance, the oil pump, formerly placed inside the crank-case at the bottom, now is on the top of the crankcase and at the top, where it is within easy reach and in plain sight, on the assumption that though a good pump does not often go wrong, there is a certain feeling of comfort in knowing that if any trouble should develop it can be corrected without a preliminary tearing down of the crankcase.



HAYNES DASHBOARD AND CONTROL

While by no means a new Haynes feature, the method adopted in the installation of the exhaust valves is of interest as indicating the care that is taken in matters seemingly of minor importance. The guides in which the valve stems work are made of unusual length, running up to within an eighth of an inch of the head of the valve. By virtue of this construction the valve stem is provided with a very large area of bearing surface, and at the same time it is protected from the intense heat of the exhaust gases, at a point where protection is of importance as a preventive of warping.

Briefly, the specifications of the Haynes model 22 include a wheelbase of 120 inches, 40-horsepower long-stroke motor of the T-head type, with cylinders 4½ x 5½ inches bore and stroke, respectively, dual ig-

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nition with Eisemann magneto and storage battery for starting, contracting steel band clutch on bronze drum, supported by the crankshaft, three-speed selective gearset operated by lever placed inside the body of the car, the gearcase being carried on two arms extending from the rear end of the motor crankcase, Timken full-floating rear axle and Timken roller bearings in front axle, 36 inch wheels with 4½ inch tires front and rear, sheet steel body, upholstered with black hand-buffed leather, black finish with 18 coats of paint, hand-rubbed, and all metal trimmings black and nickel. The regular equipment, which is included in the price of $2,250, is changed only in the matter of headlights, electric lights being furnished instead of the former gas lamps, in keeping with the "electrification" of the car; the items include silk mohair top, top cover, two large electric headlights, electric signal horn, electric cowl lamp, three oil lamps, glass windshield, Warner autometer, bumper, bulb horn, coat and foot rails, tire irons, one extra demountable rim and the usual tools.

Mud Fails to Stop Pathfinder.

Although no occasion has arisen as yet for the use of the "trolley tapping" fish pole which is being carried by one of the gasolene consorts of the Flanders electric coupe which is blazing the 1,100-mile trail for the coming National Reliability tour, it is not at all unlikely that unless the storms abate and the floods which have covered the Tennessee and northern Mississippi roads for the last few days subside, the pole will yet be put in use. On Thursday last, August 8th, the car was at Mammoth Cave, Ky. Friday a run of 108 miles to Nashville, Tenn., was made, while Saturday disclosed the tourists at Columbia, 43½ miles away. Sunday evening the car arrived at Loretto after a 51-mile run; Monday 68 miles to Iuka, Miss., were completed. The bad going encountered Tuesday last permitted of but 30 miles being covered, which took the tourists to Corinth, with slightly over 100 miles separating them from Memphis.

COMMENDS THE SMOOTH TREAD

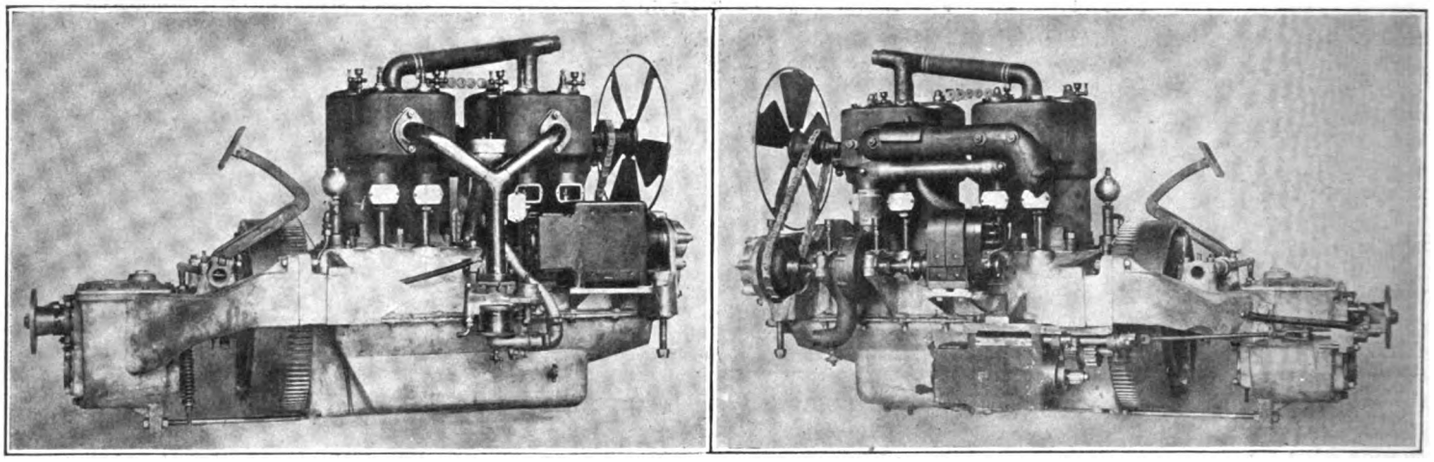
Various Types of Treads Discussed by Eminent Authority—Advantages and Disadvantages Made Plain.

"The best all-around tire for ordinary use is the plain, round tire," frankly admits P. W. Litchfield, factory manager of the Goodyear Tire & Rubber Co., Akron, O. "It rides the easiest, wears the longest, and consumes the least power to drive the vehicle, reducing the fuel bills and increasing the speed. The disadvantage of the smooth tread is that it is apt to slip on certain surfaces, causing loss of traction and skidding. Where these conditions are met, it is advisable to introduce a surface on the tire to prevent them. Thousands of designs have been adopted, consisting of various shaped projections of rubber, metal studs, coiled wire springs, indentations in the rubber, etc. The metal studs and coiled wire springs have gradually decreased in popularity, owing to the excessive first cost of the tire, in combination with a much decreased mileage, making the cost per mile prohibitive against the results accomplished by the rubber studs. Therefore we have adopted projections of rubber for our non-skid tire.

"In selecting a design, the following things are to be borne in mind: First, maximum resistance to skidding; second, projections which will wear as long as possible with as little injury to the tire as possible; third, attractive appearance; fourth, something which will be distinctive from others. Taking up the first point, we find that skidding usually is in the direction of about 45 degrees to the direction in which the car is going, being a combination of the forward movement of the car and the side-slip of the tire; therefore, we turned our surfaces at an angle of 45 degrees, which brought us to the diamond-shaped projection. Next, we found that the squarer the angle of rubber in contact with the ground the better the grip and the less danger of skidding; therefore, instead of a rounded surface, where the button comes in contact with the ground, we use a sharp edge.

"Next, we found that if the buttons projected uprightly from the carcass of the tire, that the load of the car resting upon those buttons of rubber, compressed them locally against the fabric of the tire, tending to cause fabric separation, due to the unequal pressure; therefore, we avoided this by putting in a rounded filler, where the rubber button comes in contact with the carcass, to distribute the strain equally over all the fabric of the tire, then we made the buttons as high and distinct as possible without throwing undue strain upon the carcass. To get an attractive appearance, we lined up those buttons symmetrically and avoided any attempt at lettering or fancy shapes, as we wished the design to appear symmetrical when partly worn down, as well as when new.

"We also lined up the buttons in the direction of the rotation of the tire, instead of first throwing them one way and then the other, to avoid vibration and to keep the car in a straight path. When we had accomplished this, we found we had a design which was different from that of anyone else and more effective, mechanically, for the purpose intended. To effect this result we had to depart from the ordinary machine work in making our molds and make them entirely by hand-filling and engraving. It takes four men about three weeks to make one mold for a non-skid band."



BOTH SIDES OF HAYNES MOTOR SHOWING STARTER AND GENERATOR POSITIONS

When Clutch Leathers Should Be Scraped.

Although the application of castor oil to the face of the clutch leather is the correct treatment for "fierceness," the oil never should be applied unless the leather previously has been scraped. When the leather is run dry, a glossy coating appears which is impenetrable, so that the oil simply serves as a lubricant between the two polished surfaces. If the surface is scraped, however, the oil softens the leather and makes the clutch grip "sweetly."

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SIZZLING SPEED AT GALVESTON

Disbrow Principal Performer Though Others Take Their Share of Prizes—Short Course Prevents Records.

Neither weather nor tide, either one or both of which are more or less prone to interfere with the order of things at beach racemeets, especially so when the program extends over several days, marred the three-day program which was run off Thursday, Friday and Saturday last, August 8th to 10th, on the sand at Galveston, Tex. Not one of the eleven events offered by the Galveston Automobile Club was scratched or shortened, and all followed in order as announced on the program. Spectators were not lacking at any time during the meet, for the crowd that filled the canvas covered grandstand was augmented by those who remained in the cars, which were parked three and even four deep around the course.

Although it had been predicted that records would fall, and there is little doubt but that the "talent" which is capable of establishing records was present, the limited length of the course, which measured but two and one-half miles out and home prevented the smashed figures that were expected. The local record for the single mile, however, which was set at 37.8 by Zengle when he drove his National at the meet a year ago, was clipped to 31.11 by Louis Disbrow, who covered the distance on the second day of the meet in the reconstructed racing machine ycleped "Jay-Eye-See."

Breaking the local beach record, however, did not constitute the sum total of Disbrow's achievements. He not only took the 200-mile free-for-all, which was the sole number on the program of Saturday, 10th inst., and which was the star event of the meet, but he also accounted for the other two big events which were offered, the 75-mile Class E race for large cars, which finished the program of Thursday, and the 50-mile free-for-all which was included in the program of Friday. In each of the three Disbrow drove the Simplex which has served him well on many other occasions. His time for the 200-mile event was 3:06:17.9, which figures out at the rate of 64.4 miles an hour. Zengle last year covered the 150 miles in 1:06:06, at the rate of 71.3 miles an hour. Disbrow finished the 75-mile event in 69:16.70, while his time for the 50-mile event was 46:18.19.

On Thursday, the first day of the meet, five events were staged, four of them being for Class C cars. The first two, which went for 15 miles each and were open to cars with piston displacements of 161-230 and 231-300 cubic inches, respectively, were won by Joe Nikrent (Case), who completed the distance in 15:04.62, and Harry Endicott, who drove his Mason across the wire in 15:57.55. The 20-mile event for cars with displacements of 301-450 inches proved easy for Paul Plummer (National), who took the event from his sole contender, Stoltz (Stutz) in 20:05. Robert Evans, driving a Studebaker "20," took the 10-mile event from his team mate, Jack Tower, who also held the wheel of a Studebaker "20," covering the distance in 11:07.09.

Naturally the 75-mile event proved the most interesting, though had competition been a little more in evidence even more interest would have been added. Eleven contenders started, but fate in the form of various kinds of trouble put all save five out of the running. Disbrow eagerly forged to the front and passed the grandstand at the end of the first lap in first place, which position he held through the remaining 14 laps. Equally consistent was the driving of George Clark (Mercedes), who maintained second position throughout the entire grind and finished 25.96 seconds later than the winner. Third position went to H. Endicott, who drove the Mason entry across the tape slightly more than three minutes after Disbrow; fourth and fifth positions went to Ulbricht (Case) and A. Ferguson (Mercer), respectively.

In the curtain raiser on Friday, which went for 25 miles and was for cars with displacements of under 230 inches, Harry Endicott played the leading role and drove has Mason across the tape in 23:25.76. Robert Evans (Studebaker "20") took second prize. The two other Class E events which were included in the second day's program, both of which went for 25 miles, were for cars with displacements of under 450 and under 300 inches, respectively, and were won by Paul Plummer (National), who completed the distance in 23:54.69, and Joe Nikrent (Case), who covered the course in 23:29.09.

Seven contenders started in the main event, the 50-mile free-for-all, though but seven finished. As was the case with the 75-mile event, which was run on the day previous, Disbrow led the field from start to finish. George Clark, Mercedes pilot, assumed second position after the fourth time around and, once placed, he "stayed put" until the finish and crossed the tape 34.78 seconds later than the Simplex driver. Joe Nikrent in a Case, who had lost a rear shoe during the fifth lap and completed the race on the rim, finished in third position, while fourth and fifth places went to B. Endicott (Case) and Melaun (National), respectively.

Fourteen contenders started in the 200-mile race which was staged on Saturday, the last day of the meet, though but four of them succeeded in crossing the tape for the foreiteth time. Disbrow assumed the lead from John De Palma (Fiat) at the end of the second lap and held it until displaced by George Clark (Mercedes) in the eighth lap, and he, in turn, was displaced by Harry Endicott (Mason) during the tenth lap. It was then a case of see-saw between the winner and Endicott until the 25th lap, when Disbrow forged ahead and was not again displaced. He crossed the tape 2:06.11 ahead of Endicott. Third place went to Clark (Mercedes), and Robert Evans (Studebaker) finished in fourth position. Paul Plummer (National), who had forged ahead step by step through each succeeding lap, until he was in fifth position, was forced to retire by a bent forward axle during the 37th lap.

Thursday, August 8th.

Fifteen miles, for cars with displacements of 231-300 inches—Won by Joe Nikrent (Case); second, Louis Disbrow (Case); third, A. Ferguson (Mercer). Time, 15:04.62.

Fifteen miles, for cars with displacements of 161-230 inches—Won by Henry Endicott (Mason); second, Jack Tower, Studebaker "20"); third, Robert Evans (Studebaker "20"). Time, 15:57.55.

Twenty miles, for cars with displacements of 301-450 inches—Won by P. Plummer (National); second, Stolz (Stutz). Time, 20:05.

Ten miles, for cars with displacements of under 161 inches—Won by Robert Evans (Studebaker "20"); second, Jack Tower (Studebaker "20"). Time, 11:07.09.

Seventy-five miles, Class E, for cars with displacements of 600 inches and under—Won by Louis Disbrow (Simplex); second, George Clark (Mercedes); third, Harry Endicott (Mason); fourth, Ulbricht (Case); fifth, A. Ferguson (Mercer). Time, 69:16.70.

Friday, August 9th.

Twenty-five miles, Class E, for cars with displacements of 230 inches and under—Won by Harry Endicott (Mason); second, Robert Evans (Studebaker "20"); third, Jack Tower (Studebaker "20"). Time, 23:25.76.

Twenty-five miles, Class E, for cars with displacements of 450 inches and under—Won by Paul Plummer (National); second, Louis Disbrow (Case); third, Joe Nikrent (Case). Time, 23:54.69.

Twenty-five miles, Class E, for cars with displacements of 300 inches and under—Won by Joe Nikrent (Case); second, Louis Disbrow (Case); third, Christie (Studebaker). Time, 23:29.09.

Fifty miles, free-for-all—Won by Louis Disbrow (Simplex); second, George Clark (Mercedes); third, Joe Nikrent (Case); fourth, B. Endicott (Case); fifth, Melaun (National). Time, 46:18.19.

One mile, time trial—Louis Disbrow (Jay-Eye-See). Time, 31:11. Old record, 37:08.

Saturday, August 10th.

Two hundred miles, free-for-all—Won by Louis Disbrow (Simplex); second, Harry Endicott (Mason); third, George Clark (Mercedes); fourth, Robert Evans (Studebaker). Time, 3:06:17.90.

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BAD ROADS MAR MINNEAPOLIS TOUR

Only Two Out of Eleven Reach Winnipeg, Half-Way Mark, With Clean Slates—One Car Withdrawn.

With eleven contestants in line, five in the touring car division competing for the Minneapolis Journal trophy, and six in the roadster class competing for the Minneapolis News trophy, the fourth annual endurance run of the Minnesota State Automobile Association left the Twin Cities Thursday last, 8th inst., with Winnipeg, Can., as the ultimate destination and turning point. The itinerary provides that some 1,088 miles be covered during a single week, the cars being scheduled to re-enter Minneapolis at noon to-day, 15th inst.

Contrary to practice which has been followed in previous tours, black marks are allotted only for motor adjustments and for late arrival at controls, technical inspection at the conclusion of the run having been abandoned. By choosing Winnipeg as the destination of the run, a more or less international flavor was given to the affair, though special arrangements with the customs officials were necessitated.

The first day's run took the tourists 171.9 miles out from Minneapolis to Wadena. Rough roads were encountered all the way, and but five of the contestants entered the first night's control with clean scores. Most of the penalties were acquired because of delays occasionad by "ditching." W. H. Soules, who piloted a Studebaker "20," received 9 demerits for lateness, and H. W. Fawkes (Reo), F. L. Palmer (Cutting) and Paul Carpenter (McFarlan) received 5 points each for the same cause. Edward Fox, who drove a Paige Detroit, received 100 points for work done on his motor, and Clarence Munzer had 3 chalked against him when he refilled the radiator of his Hupmobile at a place remote from a control.

The route from Wadena to Thief River Falls, which was covered during Friday, was practically a repetition of the first leg of the journey, save that the roads were worse. Just out of Waubon a particularly bad spot was encountered, in which the Paige Detroit car driven by Fox sank up to the hubs and remained for a couple of hours until pulled out by a farmer's wagon. Fox collected another 66 points for arriving late at the night control. The others who were penalized during the second leg of 166.4 miles were George Murphy (Mitchell), 3 points for refilling the radiator, and Clarence Munzer (Hupmobile), 3 points for a like cause.

On Saturday evening the tourists entered Winnipeg, after having encountered some particularly bad stretches of road in Northern Minnesota and Manitoba. Noah Moss, who drove a Staver, was forced to retire at Hallock, the noon control, by a broken steering gear. Before the day's run of 177.2 miles had been covered, three more points had been added to as many scores, one each to Clarence Munzer (Hupmobile) and H. W. Fawkes (Reo) for having stalled their motors, and one to Harry Rockelman (Warren), who experienced ignition trouble.

Sunday was a much-needed day of rest, though several of the party went sightseeing, while others profited by the opportunity offered to put their cars in first-class shape for the return to Minneapolis. The scores at the end of the first half of the run were:

Touring car class: John Fawkes (Marmon), 0; Paul Carpenter (McFarlan), 5; George Murphy (Mitchell), 3; Edward Fox (Paige-Detroit), 166; Harry Rockelman (Warren), 1. Runabout class: A. Zeckman (Cadillac), 0; P. L. Palmer (Cutting), 5; H. W. Fawkes (Reo), 6; Clarence Munzer (Hupmobile), 7; H. W. Soules (Studebaker), 9; Noah Moss (Staver), withdrawn.

Nothing But Burman at Cleveland.

Rain—an abundance of it—cut short the E. A. Moross meet which was run on the North Randall track, Cleveland, Ohio, Wednesday last, 7th inst., though the interference did not evidence itself until Burman had taken three of the four events which were run. A five-mile class E event, which he finished in 5:06⅗, driving the Cutting, two three-mile heats for the Remy Brassard and trophy which were respectively completed in 2:43⅗ and 2:47⅖ in the Ohio car, and a single mile at the wheel of the Blitzen Benz, which was covered in 49⅗ seconds, made up the list of his victories. The other event, five miles for cars with displacements of 600 inches or under, went to Harry Kyle (White), who completed the distance in 4:39⅗. The summary:

Five miles, Class E, for cars with displacements of 600 inches and under—Won by Robert Burman (Cutting); second, Harry Kyle (White); third, Stouffer (Flanders). Time, 5:06⅗.

Three miles, for Remy Brassard and trophy. First heat—Won by Robert Burman (Ohio); second, H. Hickman (Mercedes); third, Harry Kyle (White). Time, 2:43⅗. Second heat—Won by Robert Burman (Ohio); second, H. Kyle (White); third, H. Hickman (Mercedes). Time, 2:47⅖.

One mile, time trial—Robert Burman (Benz). Time, 0:49⅗.

Five miles, Class E, for cars with displacements of 600 inches and under—Won by H. Kyle (White); second, S. H. Brown (Stoddard-Dayton). Time, 4:39⅗.

Fan's Relation to Overheating.

A fan that is placed at a considerable distance from the radiator is far less efficient as a cooling agent than one that is as close to the radiator as it can be placed without danger of scraping. Many cases of overheating have been cured by placing the fan closer to the radiator.

AMATEURS LEAD AT HALF-WAY MARK

Chicago Reliability Run Then Abandoned Because of "Soupy" and Sandy Roads—Trade Drivers Are Outclassed.

Neither the amateurs nor the trade drivers, members of the Chicago Motor Club, who competed on Thursday last, 8th inst., in the second annual reliability run for the Banta trophy, came off victorious, for the untimely intervention of the "weather man" necessitated the abandonment of the run after the first half, 118 miles, to St. Joseph, Mich., had been completed. The run early developed into a contest between man and the elements, for to the troubles which were caused by the hub-deep sand encountered on the Indiana roads were added the "joys" of traveling through mud of the same variety caused by the heavy rains which flooded Southern Michigan. When, after many trials and tribulations, the 19 contestants finally reached the turning point, the amateurs led the trade team by 150 points; the corrected score standing at 153 to 3. The greatest part of the penalties which were recorded against the trade team was earned by C. E. Gregory (Chalmers), who suffered four blowouts and innumerable punctures and was charged 133 points. The remaining 20, added by P. Bartelstein (Peerless), were occasioned by a slipping clutch. On the amateur team only N. H. Vansicklen, who annexed a point because of a stop to adjust the dust pan on his Apperson, and F. C. Lewin, who tightened the clutch adjustment of his Chadwick and earned the other two points thereby, were penalized. Because of the continued heavy rains, a majority of the contestants voted to abandon the contest, and their cars were shipped back to Chicago. The starters were:

Amateurs—N. H. Vansicklen, Apperson; Sam Hirschel, Mercer; Claude Anderson, Stutz; M. J. Kavanaugh, Midland; F. C. Lewin, Chadwick; C. W. Swigert, Premier; C. H. Hatch, Stutz; C. G. Sinsabaugh, Abbott-Detroit; E. C. Patterson, Packard.

Trade—M. H. Luce, Velie; Will Stalnaker, Premier; S. Breakstone, Midland; C. E. Gregory, Chalmers; H. O. Steusel, White; Brent Neal, Speedwell; W. D. Foreman, Chalmers; A. Bartelstein, Premier; J. C. Zimmerman, Stutz; Otto Owen, Reo.

Says Automobile Hurts Trunk Trade.

That the automobile is responsible for a decline in the trunk trade is the somewhat unusual claim made by H. J. Fitzgerald, a Chicago trunk merchant, who appeared before the board of review in an effort to explain why his personal property assessment should be reduced from $15,000 to $12,000. He said that whereas well-to-do people used to pack a number of trunks and visit summering places in hot weather, they now found automobile trips more pleasant.

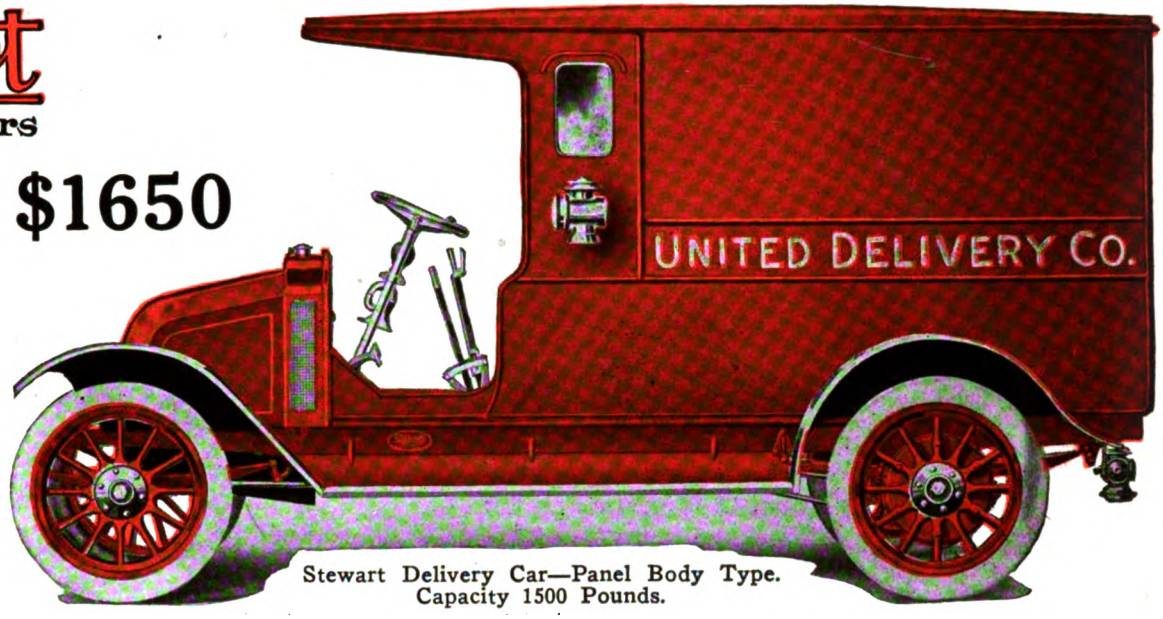
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Stewart Delivery Cars

Chassis $1650

Stock Bodies

Panel $150
Express with Top...$125
Open Body with Cape Top.....$125
Special Express Body with wire grating.$150
Undertaker's Car Body $550



Stewart Delivery Car—Panel Body Type.
Capacity 1500 Pounds.

ANNOUNCEMENT!

A New Big High Grade Delivery Car Built by Experienced Makers and Selling at a Moderate Price.

WE announce the new STEWART delivery car—big, roomy, up-to-date, high grade in construction and with more desirable, standard features than any other ever offered at any price. A car manufactured by a well organized, amply financed, thoroughly experienced company.

Note these striking features of this new car; every one of well-proven merit:

Continental Motor—Specially designed for severe commercial use, long stroke, slow speed, 30 H.P., 3¾" x 5¼", three big bearings on crank shaft, cylinders en bloc, recirculating oiling system direct to bearings and gears, valves enclosed, Bosch magneto. Water pump circulation.

Brown-Lipe Selective Transmission—Recignized everywhere as the best; safety latch on reverse. Multiple disc dry plate clutch.

Special Timken Axles—Front and rear, shaft drive, 5 to 1 gear ratio, 17" brakes, two sets, Timken roller bearings used throughout running gear and transmission.

All other mechanical features of equally well recognized quality.

Big Tires 34" x 4" front, 35" x 4½" rear.

Bodies of New Design—Larger than usual, 7 foot loading shpace, beautifully finished and well ironed with forgings. Wheelbase, 126".

Everything simple and accessible; all units quickly and easily removable and interchangeable; grease cups throughout; touring car complications eliminated; left-hand steer; center control levers; driver can enter or leave from either side of car.

The Men Behind

This splendid car is built by men experienced in the delivery car business. T. R. Lippard, president and manager of the Stewart Motor Corporation, was formerly vice-president and manager of the Lippard-Stewart Motor Car Co. He has had exceptional experience in the manufacture and selling of motor cars—both pleasure and commercial. He is also well equipped with thorough training in other lines of manufacturing.

R. G. Stewart, designer of the STEWART delivery car and vice-president of the corporation, is an engineer of widely recognized ability. He was the designer of the Lippard-Stewart car. Prior to this he was connected for years with such concerns as the Olds Motor Works, the Franklin Automobile Company and others. The STEWART car, his latest achievement, represents the climax of this wide experience.

Pioneers in Field

Messrs. Lippard and Stewart were the first to put on the market a thoroughly high-grade, scientifically designed delivery car at a medium price—in fact, at any price. They have organized the new company to manufacture such cars—greatly improved—on an extensive scale.

The Stewart Motor Corporation, though newly organized, is manned in every department by well trained, competent men. Men who know the automobile business, men who know what dealers want and how to assist them. This company has ample factory equipment and facilities for turning out a large output. Shipments start in September.

Dealers Wanted

Big successes are being made and will continue to be made in the commercial car field. It offers the greatest money-making possibilities in the motor car business. No seasons. No trading. No yearly models. No expensive establishment. You can sell a merchant from three to ten delivery cars with no more effort than it takes to sell one touring car.

Here is a delivery car—the STEWART—that offers unequalled selling possibilities for live dealers. Never before has there been such a demand on the part of merchants for a high-grade, scientifically designed delivery car.

They are through experimenting with converted touring cars. They have learned that only well-made, high grade delivery cars will stand up and prove economical. They are already convinced of the value of motor delivery. Now they want to find the right car.

The STEWART ideally fills this waiting demand.

Send in the Coupon

We want live dealers—lots of them. We have a proposition that will make money for you. Our terms are most attractive. Our cars are easy to sell.

Write for our catalog and dealership proposition. Send in the coupon today before someone else secures your territory.

STEWART MOTOR CORPORATION,
Randall and Superior Sts., Buffalo, N. Y.
Please send your catalog and dealership proposition.

Name .....
Street .....
City..... State.....(M.W.)

Stewart Motor Corporation, Buffalo, N.Y.

T. R. LIPPARD, Pres. and Mgr. R. G. STEWART, Vice-Pres. and Chief Eng. R. P. LENTZ, Sec. and Treas. ROBT. W. INGERSOLL, Sales Mgr.

Separate from and having no connection with the Lippard-Stewart Motor Car Company

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Overland 1913

$985

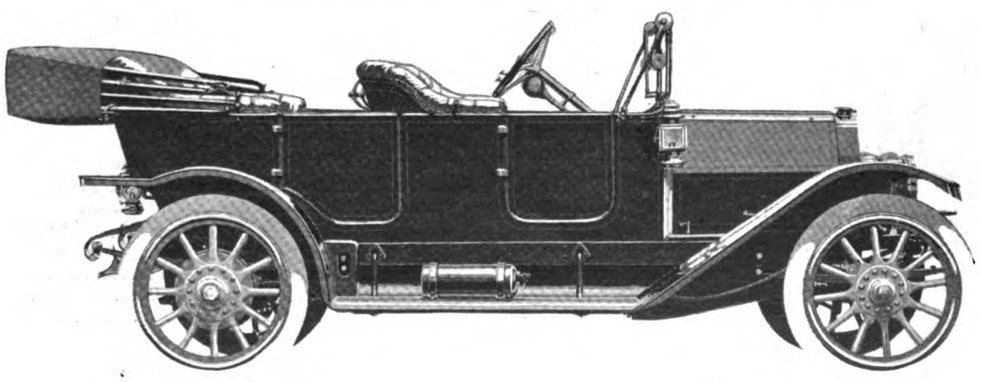
Moded 69T, Completely Equipped
F. O. B. Toledo

Some of the Big Features

Self Starter
30 Horsepower
5-Passenger Touring Car
110-inch Wheel Base
Timken Bearings
Center Control
$50 Remy Magneto
$50 Warner Speedometer
$50 Mohair Top and Boot
$25 Clear Vision Wind Shield
$25 Prestolite Tank

¶ These two automobile values smash all previous records. Read each set of specifications carefully. See what an unusually complete and fine equipment of standard accessories each car carries. Demonstrations now going on all over America. Arrange for one in your city at once.

The Willys-Overland Company, Toledo, Ohio



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Overland 1913

$1475

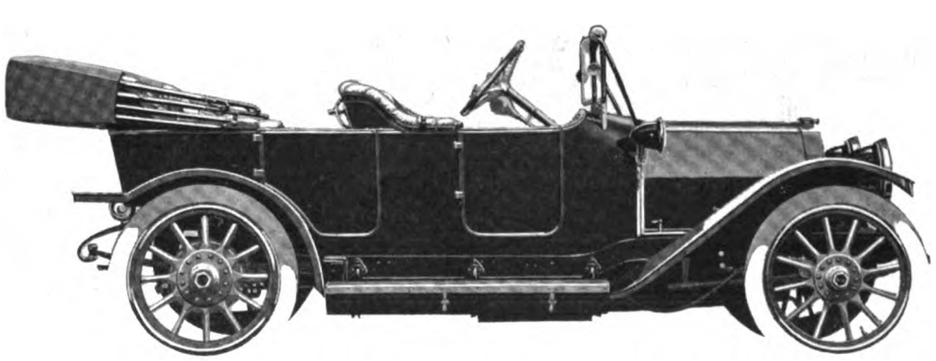
Model 71T, Completely Equipped
F. O. B. Toledo

Some of the Big Features

Complete Electric Lighting Outfit — Generator and National Storage Battery
Self Starter
45 Horsepower
Timken Bearings
Center Control
Wheel Base 114 inches
$50 Warner Speedometer
$50 Mohair Top and Boot
$25 Clear Vision Wind Shield
$25 Prestolite Tank
Brewster green body—ivory striped, nickel plated and dead black trimming

¶ 40,000 cars a year makes these two values possible. Operating on the largest scale, we can produce at the lowest prices. In a word, we are able to give more car for less money than any other manufacturer in the world. Handsome catalogue fully describing complete 1913 line on request.

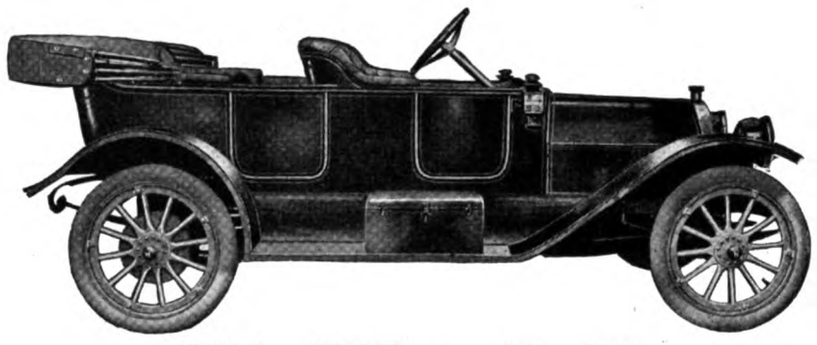
The Willys-Overland Company, Toledo, Ohio



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THE 1913 Halladay "32"

Built for the Man Who Wants a Small Car With Less Cost of Upkeep, But Who Demands the Same Quality and Dependability Found in Cars of the $1800 to $2400 Class.



Halladay "32" Touring—Price $1200

Read and compare the dominant features of this remarkable car.

MOTOR with reserve power, long stroke and enclosed valves.

TRANSMISSION placed amidship on sub-frame; nickel chrome-steel gears; annular bearings throughout.

BRAKE DRUMS are extra large, of double internal expanding type.

CARBURETOR with dash adjustment.

DEMOUNTABLE RIMS with excess size tires—Goodyear No-Rim-Cut.

DESIGNED for accessibility of parts—any unit can be removed without disturbing any other—a dominant Halladay feature.

TONNEAU large and roomy, with luxuriant upholstery, tilted cushions for real comfort.

DROP FRAME with long three-quarter elliptic springs, producing low hung effect, insuring stability and perfect balance. Wheel base 112 inches.

TRIMMINGS of nickel and black enamel.

COLOR—Halladay Golden Brown, Brewster Green or Blue—all with black fenders and shields.

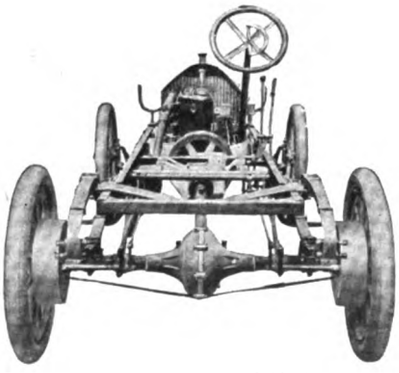
BODY—Two Passenger Roadster and Five Passenger Touring.

EQUIPMENT: Five lamps, Prest-O-Lite tank with box for same; tool box, horn under hood, tire irons in rear. Extra demountable rim, pump, tool and repair kit, foot and robe rails.

PRICE—$1200.

ELECTRIC LIGHT EQUIPMENT: This car will not be equipped with a cheap outfit. If you want full electric light equipment, including 20-candle power wire type Tungsten bulb headlights, with Deaco generator, it will be furnished for $100 additional.

There are two other models in the Halladay family—the "40" at $1800, and the Six-"50" at $3000—all of the same design—all bearing the dominant Halladay features, and all built to blue print under the same rigid inspection. Write and let us tell you about them.



Note the sturdy strength and ideal construction shown by the rear view of the chassis.

We have recently purchased an adjoining plant, thus increasing our floor space to 10½ acres. With our enlarged facilities and an organization backed by eight years of car building experience, we are better equipped than even to turn out our increased output for the 1913 season.

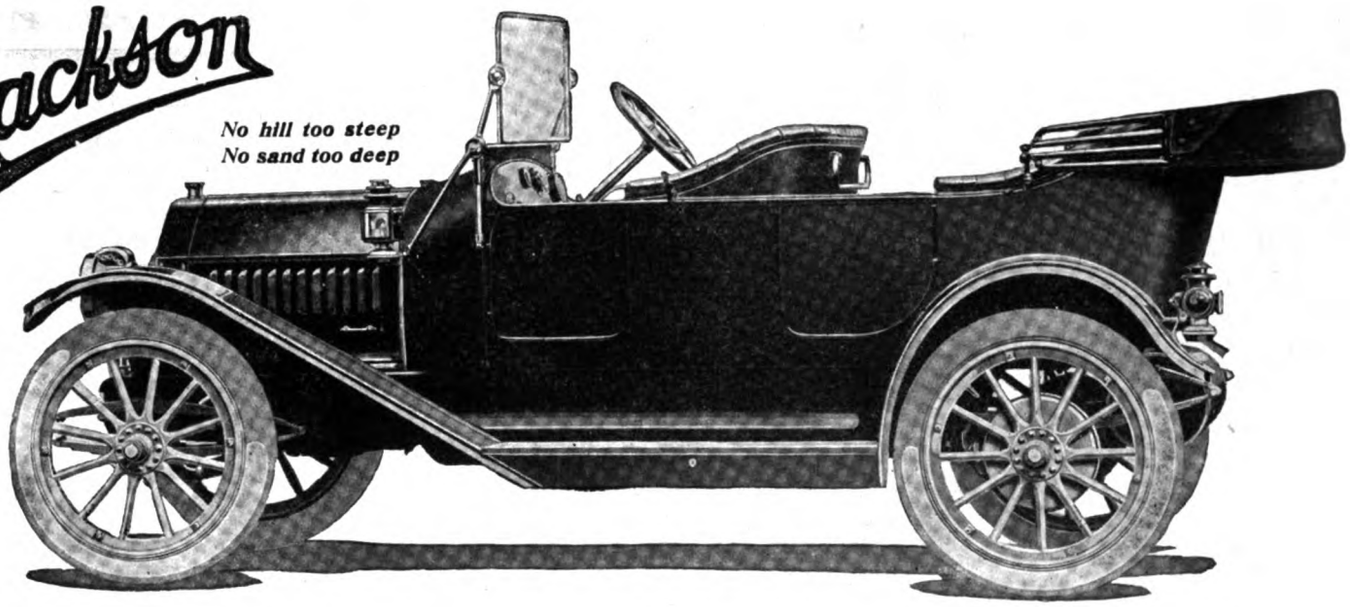
If you are now an automobile dealer, or propose entering the industry for a real business, write us forour agency proposition. We have one which cannot fail to interest you, because at the end of the season it will show you a good profit.

STREATOR MOTOR CAR COMPANY, Streator, Illinois

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Jackson

No hill too steep
No sand too deep



1913 Jackson "Olympic"—$1500

35 H.P. long-stroke (4⅛ x 4¾) motor; 34 x 4 inch tires; 115 inch wheelbase; full elliptic springs; deep, roomy body with 10-inch upholstering; black and nickel trimmings. Regular equipment includes Self-starter, Mohair Top, Top Hood, Ventilating Windshield, Speedometer, Oil Gauge and Gasoline Gauge on Dash, Gas Tank, Demountable Rims, Extra Rim. Tire Carrier, Robe and Foot Rails in Tonneau, Pump, Jack, Tire Outfit and Tools.

Other Models

The "Majestic" at $1850 has a long-stroke (4½ x 5¼) motor of 45 H.P. Its wheelbase is 124 inches; tires, 36 x 4 inches; springs, full elliptic, front and rear. It is equipped with Self-starter, Mohair Top, Top Hood, Ventilating Windshield, Speedometer, Oil Gauge and Gasoline Gauge on Dash, Demountable Rims, Extra Rim, Tire Holder, Electric Horn, Foot Rail, Coat Rail, Pump, Tools and Jack. It has powerful electric headlights with parabolic reflectors, flush dashlights (electric) and an electric tail lamp. The current for the lights is supplied by a dynamo driven by the motor, which charges a storage battery for use when the motor is not running. The car has black and nickel trimmings.

A new Jackson policy along with the new Jackson cars

THE PUBLIC HAS JUST RECEIVED, in the Saturday Evening Post, our first announcement of the new Jackson models for 1913.

AND THE ANNOUNCEMENT marks the inauguration of a new policy on the part of the Jackson Company.

THIS POLICY PROVIDES for the most forceful advertising campaign that has ever been undertaken.

IN OTHER WORDS, the strongest, most efficient co-operation we have ever given Jackson dealers in the way of national and localized sales publicity.

THE NEW JACKSONS are really sensational cars.

THEY ARE AS COMFORTABLE, as easy riding, as silent as the highest priced.

FOR THE FIRST TIME they place cars of moderate price in direct competition in these respects, with the costliest makes.

YOU CAN SEE INSTANTLY the advantage of these two features:

CARS THAT HAVE NO SUPERIOR in the three big things—and a national advertising campaign that will tell the facts to the public, in full page and double page copy, month after month, during the entire season.

OUR FULL AND DOUBLE PAGE ADVERTISEMENTS will reach every possible automobile buyer in the country every month through at least three different publications.

THESE ARE THE STRONGEST WEAPONS we have ever placed in the Jackson dealers' hands.

WE EXPECT THEM to make 1913 a record year for the Jackson—in the number of cars sold; in the number of satisfied owners; in the number of successful dealers; in Jackson prestige.

EVERY JACKSON DEALER will share in the benefits and the profits.

AND A GOOD MANY of the up-and-doing dealers who appreciate a winning combination are going after the Jackson line.

IF YOU ARE ONE of that kind and want to participate, don't let the day go by without getting in touch.

THE GOOD NEWS HAS SPREAD around and we are signing new territory right now, and signing it fast.

WIRE, WRITE OR TELEPHONE the sales manager for an appointment.

Good dealers can build up a steady, substantial business on standard high-grade cars.

This is the kind of line we are offering.

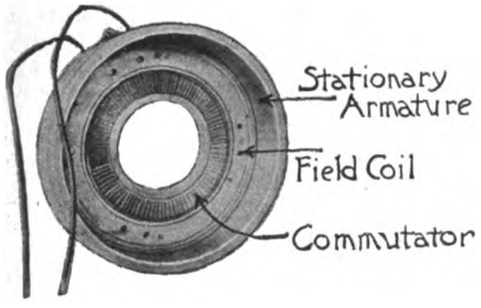
A reputation of 11 years' standing, and an advertising campaign of tremendous force, will establish the Jackson dealer in a lasting and profitable trade.

Our Six-Cylinder, Seven-Passenger Touring Car Will Be Announced Soon. Watch for It.

JACKSON AUTOMOBILE COMPANY, 1204 E. Main Street, Jackson, Mich.

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THE OTHO SYSTEM is worth the investigation of every car designer who appreciates the value of added refinements as sales builders.

There is much to say regarding this device and yet it is, from fly wheel to batteries, the very essence of simplicity.

We claim for it a dynamo-motor, capable of generating current to positively turn over the engine at the rate of 75 R. P. M.—light the car—furnish ignition—under all conditions and at all times.

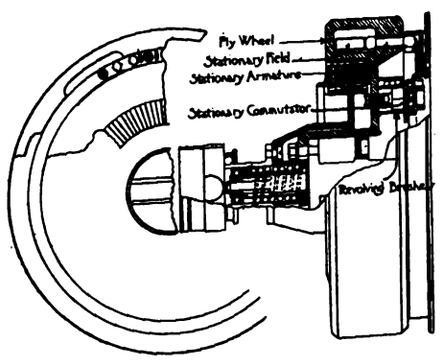
The dynamo is simple, its only moving part being the fly wheel. Here we utilize fixed field and armature coils around which the fly wheel revolves. By means of this construction the weight is reduced to less than 50 pounds.

In the wheel are located the brushes and pole pieces—nothing more, with the field and armature coils stationary on the crank case.

Not primarily, but just as a side note, it will be seen that the Otho System makes gas tanks and magnetos superfluous and unnecessary.

The Otho dynamo charges its batteries at a speed ranging from ten to thirty-five miles per hour or any other maximum speed to which you may desire to adjust. At any speed exceeding the latter the current is automatically cut off.

In starting we simply send the stored current back into the generator, transforming it into a motor. Its operation is performed through the medium of the speed lever which must be at neutral. This same movement releases compression, starts the engine, and incidentally prevents gear binding.



This, in brief, is the Otho Starter and generator. It will be an open book to any investigating engineer and we stand ready to show how it can be built as an integral part of the engine.

Let us give you the facts in the case.

The OTHO MOTOR COMPANY

BOSTON, MASS.

60 State Street

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The Warm Hand Wheel Will Help You Sell Cars for Women to Drive.

While it is possible for men to brave the terrors of winter driving and stand the severe cold and suffering incident to driving in winter weather, it is practically impossible for a woman to do this with any degree of comfort.

This is just one of the reasons why more women do not drive cars. With the advent of the Warm Hand Wheel, no longer is it impractical for a woman to drive in winter weather, even when wearing nothing heavier than her lightest kid gloves. The Warm Hand Wheel will keep both her hands and feet just as warm in zero weather as they would be in this month.

It is just another one of the reasons why every motor car dealer should boost for the Warm Hand Wheel. Insist upon having the car you sell so equipped. If the manufacturer is not inclined to heed your request, communicate with us and we will help you.

There is no more sense in driving a cold car in the winter time than there is in walking around in winter with a negligee costume on. And remember this, too, please—you need a heated steering wheel six months out of the year.

And, incidentally, nobody will appreciate the advent of the Warm Hand Wheel so much as the dealer, for the use of the Warm Hand Wheel simply means a greater use of cars in winter time and, consequently, more sales of cars in the winter time.

Remember that the Warm Hand Wheel is made so as to operate either by means of preheated fresh air or by means of an electric heating coil in a specially designed wheel, which can be placed upon any car and operated by the electric current therein. For more details concerning this matter communicate direct with us.

WARM HAND STEERING WHEEL CO., 527 Fifth Ave., New York City

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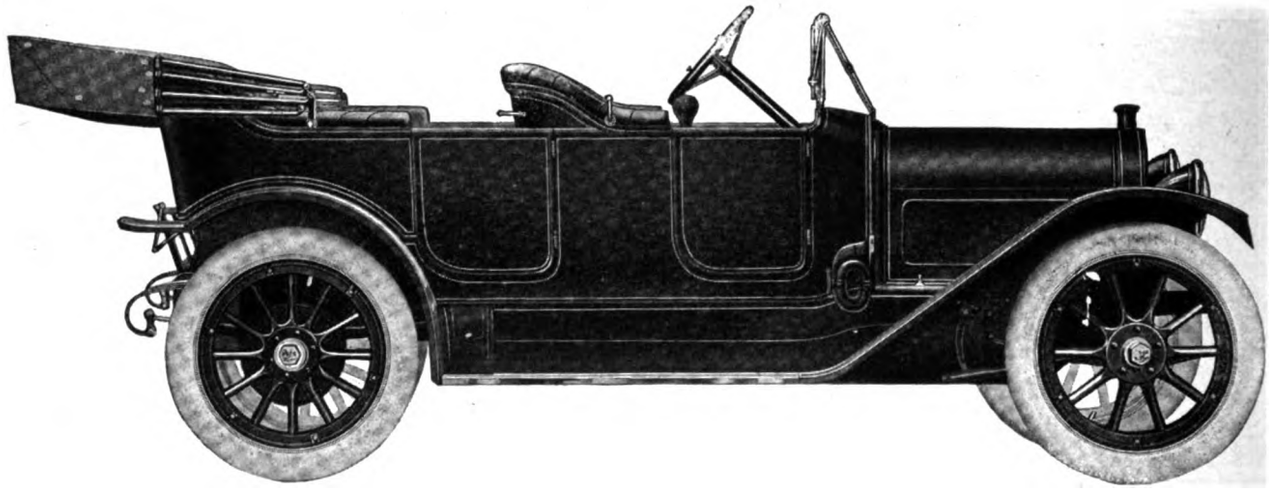
POPE QUALITY

1913 - POPE-HARTFORD

Three Distinct Models — Three Schedules of Prices

LONG STROKE MOTOR — ELECTRIC SELF STARTER — ELECTRIC DYNAMO LIGHTING SYSTEM —

40 Horsepower
$2,250
A NEW POPE-HARTFORD "40"



Model 31 is an entirely **New Pope-Hartford Motor Car,** far and away the best for the money ever offered the American public and the **first car** of **highest quality** offered by a **responsible maker** at a **low price.** **$2,250** We invite comparison of its **Long Stroke Motor—Double Drop Frame—Four Speed Roller Bearing Transmission—Full Floating Roller Bearing Rear Axle**—its **Efficient Brake System**—its **Power, Strength** and **Speed,** the **Body Lines, Deep, Luxurious Upholstery** and its wealth of **Equipment** and **Beauty** of **Finish,** with any car to be had at anywhere near its price. Such comparison will convince you that what we say regarding **Model 31** is a sober statement of fact, easily believed if you stop to consider that this car is a **Full Fledged Pope-Hartford,** embodying in every mechanical and structural detail, **Pope-Hartford Principles** and **Pope Quality,** and that many of its parts are identical with those used in our higher powered and consequently more expensive models.

Dealers! **The building of this new model has necessitated a last four-story structure we practically double our facilities to enables us to extend our business into territory heretofor far greater inducements than any other? Send for catalogs — NOW**

THE POPE MANUFACTURING CO.,

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VER BEEN QUESTIONED

ANNOUNCEMENT - 1913

One Quality of Material and Workmanship

WINDSHIELD—TOP—TRUNK RACK—DEMOUNTABLE RIMS—ROBE RAIL—ALL FULLY EQUIPPED

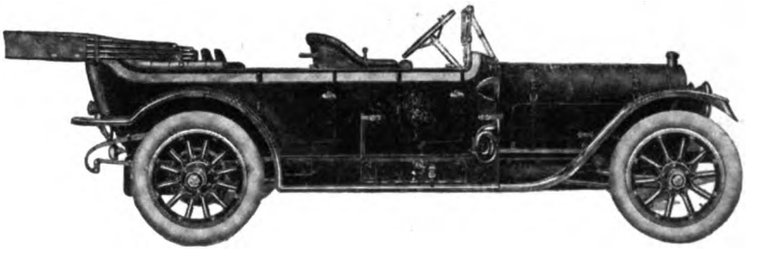
50 Horsepower
$3,250

60 Horsepower
$4,250



Model 33 The 50 Horsepower, 4-cylinder **Pope-Hartford** is known as Model 33. Every worthy and distinctive feature contributing to the success of last season's "50" is retained, and **numerous improvements** have been incorporated, including **New Body Designs—Electric Self Starter—Electric Dynamo Lighting System** and throughout will be found **refinements, structural** and **mechanical,** which place this model in the front rank with cars selling at even a higher price. If the past furnishes any basis for judgment, Model 33 is the equal of any four thousand dollar model offered by any other manufacturer. **FULLY EQUIPPED**..... **$3,250**

Model 29 is a magnificent car—wonderfully powerful in action and efficient in service. It is the **Acme** of **Pope Quality** and **the highest expression** of Six Cylinder Motor Car building. Prominent among the new features are—**Double Drop Frame—Roller Bearing, Four Speed Transmission—Roller Bearing Rear Axle—Electric Self Starter** and **Electric Dynamo Lighting System.**



Model 29 Bodies are of **new design** with convex line effect, low hung, roomy, and upholstered in a manner that insures a maximum of luxurious comfort to the occupant. **FULLY EQUIPPED**..... **$4,250**

lition to our great works at Hartford, Conn. By the erection of an immense ducing high-grade motor cars, and the increased output now possible leveloped. Do you realize that the POPE-HARTFORD line offers you : solicit correspondence from responsible dealers in unoccupied territory.

Hartford, Connecticut, U. S. A.

Digitized by Google

Cutting



Here are the biggest and best cars you can buy for the money, greater than last year's values.

WITH the factory running at full capacity and over half of the 1913 output already sold, the Clarke-Carter Automobile Company makes its announcement with the optimistic prediction that within one month the entire output will have been contracted for and allotted to customers.

This assertion is based upon the experience of last year, at which time the Cutting was almost an unknown car.

Only a few dealers appreciated its value.

Only a few knew of the organization behind the product.

If ever cars were sold by demonstration, Cutting cars were.

As was said at that time, any new car to compete successfully with old established ones must possess an excess of value.

Cutting cars did.

They cost less per horse power and per wheel base inch than any other car in the world selling for $1200.00 and over. The moment that this truth became known, the cars began to sell.

In one week alone, 357 orders poured in and within a few weeks the product was oversold.

Cutting dealers then advised an increased output which was refused.

Instead, work was started upon the 1913 product with the idea of making it as much superior to the competitors' cars as the previous models had been.

This announcement has been purposely delayed until this date because the Cutting management desired to be sure of their ground in making the statement that Cutting cars are the best you can buy for the money, not only in length of wheel base, size of body and horse power, but in material and structural details as well.

This year both wheel base and horse power have been materially increased.

Space will not permit the enumeration of the many other points of Cutting superiority, but you are asked to note one thing which will show you the careful attention that has been paid to details.

In the assembling of most medium priced cars, where two parts are bolted together, the holes are ordinarily just drilled.

In assembling Cutting cars, however, the holes are drilled and hand reamed to exact size, making a perfect fit. You can readily see the importance of such procedure inasmuch as a badly fitting bolt allows the joint to work loose and a noisy, shaky car is the result.

It is such details that mark the difference between high grade cars and mediocre ones.

CLARKE-CARTER AUTOMOBILE

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1913 Important Features

elf Starter
urkish Cushions
2 inch Upholstering
reat Ease of Riding
emountable Rims
Electric Lighting
36 in. x 4 in. Tires
Increased Wheel Base
Carburetor Dash Adjustment
Nickel Trimmings

B-40 120 inch wheel-base, 40 horse power, five-passenger car, fully equipped - - - - - - - - - - **$1475.00**

A-40 120 inch wheel-base, 40 horse power, two-passenger adster, fully equipped - - - - - - - - - - **$1475.00**

C-55 132 inch wheel-base, 55 horse power, five-passenger car, fully equipped - - - - - - - - - - **$2000.00**

only one of the things that makes cars better than the average.

equalizing system of brakes and a careked-out spring suspension are two more points of construction.

are many more.

send you a detailed description of ***urs of exceptional value.*** Ask for t "D."

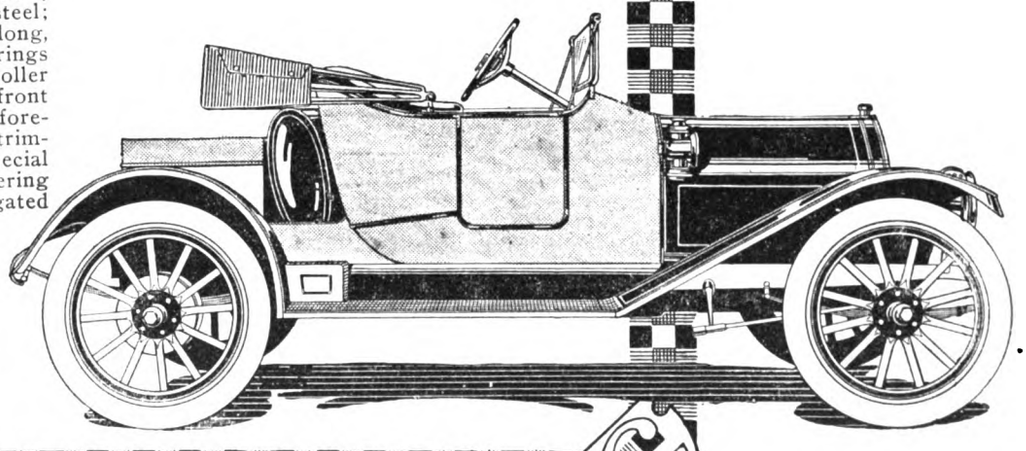
ations for A-40 Roadster, B-40 uring Car—40 Horse Power.

wer plant, three point suspension. ch bore, five inch stroke, 4 cylintor, 3 bearing crank shaft, magnebattery ignition, self contained feed oiling system, very efficient; tube radiator; three speeds forad reverse, selective sliding gear ssion; 3½% nickel steel gears, y heat-treated; multiple disc unning in oil; powerful centrifunp; 120 inch wheel base; 36x4 lemountable rims, large second hickory spokes, artillery wheels; r shaft drive, very rigid radius id propeller tube construction; ating rear axle, 3½% nickel steel; iptic front springs 40 inches long, arter elliptic scroll rear springs s long; drive shaft, Hyatt roller throughout; "I" beam front ll bearing hubs; latest type foredy, inside control, nickel trimhroughout. Steering gear, special hardened worm gear; steering 8 inches, fitted with corrugated black walnut rims; two sets internal expanding, external contracting, large positive equalizing brakes.

Specifications for C-55 Touring Car; 55 Horse Power.

Unit power plant, three-point suspension; four and three-quarters inch bore, five and a half inch stroke, 4-cylinder motor; offset cylinders; three-bearing crank shaft, magneto and battery ignition; self-contained forced-feed oiling system, very efficient; square tube radiator, three speeds forward and reverse, selective sliding gear transmission; 3½% nickel steel gears, specially heat-treated; multiple disc clutch running in oil; powerful centrifugal pump; 132 inch wheel base; 36x4½ inch tires; Booth demountable rims, large second growth hickory spokes, artillery wheels; propeller shaft drive, very rigid radius rods and propeller tube construction; full-floating rear axle, 3½% nickel steel; semi-elliptic front springs 40 inches long; three-quarter elliptic scroll rear springs 48 inches long; drive shaft, Hyatt roller bearings throughout; "I" beam front axle, ball bearing hubs; latest type fore-door body, inside control, nickel trimmings throughout; steering gear, special carbon; hardened worm gear; steering wheel 18 inches, fitted with corrugated black walnut rims; two sets internal expanding, external contracting, large positive equalizing brakes.

Deliveries begin Aug. 20.



'Surpasses the rest by actual test''

k action by progressive dealers l secure unallotted territory.

MPANY, 305 Mechanic Street **Jackson, Michigan**

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"What's in a Name"

Old Bill Shakespeare said: "A rose by any other name would smell as sweet." Quite right. Yet the very name "rose" brings to our minds a flower of delicious perfume—we know it as a "rose" and not a "sun-flower."

Hence, there's everything in a name. What's all this got to do with my pet hobby—automobiles—say you. Patience, friend reader, patience.

We are coming to the point. This is a mighty serious subject to us, only we're trying to put it in "flowery" language.

Here's the trouble. Seven years ago we sought a short, terse trade name for our burners. American Lava Company was a little too long. We burned the midnight oil and finally evolved a name for our products, culled from the initials of our firm name. The trade name we selected was ALCO—and a pretty good name it is.

It so happens that the manufacturers of an excellent car are extensive advertisers. It also happens that they are backed by a good many millions of dollars and a fat advertising appropriation. Naturally, 'most everyone thinks we purloined the name ALCO from the car manufacturer, whereas we were using it long, long before the car was manufactured under its present name.



This hexagon base gives you a grip with the pliers. Patented by us. Beware of imitations.

TRADE ALCO MARK
GERMAN LAVA
BURNERS

Now, we would like it distinctly understood that the name ALCO originated with us and not with anyone else. ALCO Burners have been and are used in all the good lamps. We're jealous of the reputation of ALCO Burners and we want all the glory that's coming to the name. Hence, we ask you to please remember that—

The Name "Alco" Originated in the Acetylene Burner Trade and with

THE AMERICAN LAVA COMPANY

P. J. KRUESI, Sales Manager **Chattanooga, Tenn.**

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"The Horn that's Made for the Discriminating"

TUTO HORN

THE TWO TONE HORN

Exclusive Features.

THE TUTO Horn was designed to do all of the signalling of the car and to be so mounted and installed as to give unfailing service, and require practically no attention from one season to another.

¶ Like the making of a verbal request in an ordinary tone of voice and the shouting of a warning, the TUTO horn provides a low note for ordinary service, taking the place of the bulb horn, and a loud emergency note for use where this milder signal does not attract instant attention. The going from the one note to the other is as simple as shouting a request where the ordinary tone of the voice is not sufficiently powerful.

¶ In the case of the TUTO horn this going from the low to the loud signal is done by merely increasing the pressure on the one button, which latter is mounted on the steering wheel.

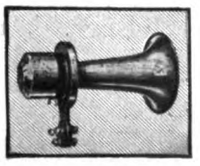
¶ The unconscious gripping of the steering wheel upon the approach of danger, forces this button down to its limit, so as to give the loud emergency note without any thought or special effort on the part of the driver.

¶ In this way it is even more rapid than it is possible to shout if an ordinary verbal request should fail.

¶ This two-tone feature can be obtained only in the TUTO horn as it is protected by our United States and Foreign patents. In addition to this valuable two-tone service, the TUTO horn includes in its regular equipment, special cord protecting fixtures and installation materials which have been manufactured especially for making a very neat and reliable installation on any motor car.

¶ Not only is the TUTO horn of double value in its signalling features, but it makes the operation unfailing and most reliable through exclusive mounting fixtures.

¶ Naturally, an electrical warning device so carefully made and incorporating such valuable features, is best for standard equipment on every motor car.

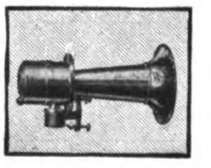


TUTO Horn, $25.00

The Dean Electric Co.

260 Taylor Avenue, Elyria, Ohio

"Look for Dean where Quality's seen"

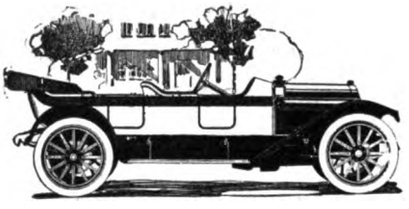


TUTO-ETTE $17.50

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Nyberg

Sixes



Have so many valuable features that an intelligent comparison of these cars with others will quickly prove the Nyberg superiority.

Nyberg Six-45 . . .	**$1750**
Nyberg Six-60 . . .	**2000**
Nyberg Four-40 . .	**1450**
Nyberg Four-37 . .	**1295**

Nyberg Automobile Works
ANDERSON, INDIANA
Chicago, Ills. **Chattanooga, Tenn.**



When We Tell You That This Exhaust Signal Has Even Greater Carrying Power Than the Higher Priced Electrical Devices—

And that this note is musical (actually keyed on one or more of the 8 primary notes).

Then, Mr. Owner, we are simply describing a perfect signal that is not only pushing the bulb horn clear off the map but that it is also gaining a firm place among signals much higher priced but less effective.

The note of the Minerva Auto Signal is distinctive, compelling—heard above street noises that ordinarily drown the harsh, strident alarm of the electric signal.

We Want You to Use This Device

We want you to prove to your own satisfaction that the Minerva Auto Horn is first of all, within reach, prices considered.

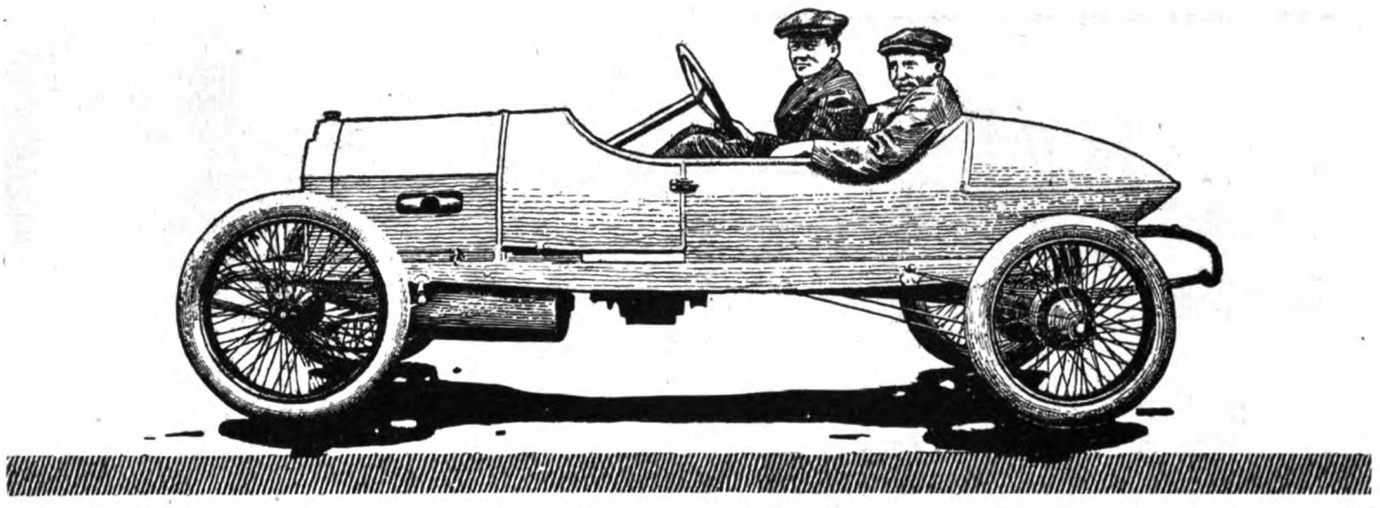
That it is strong in voice—musical—pleasing to the occupant of the cars—pleasing to those whom it warns—

And that each and every horn is made of heavy gauge brass and must be mechanically perfect before it leaves the factory.

Send for our booklet describing this signal, which comes in three different sizes adopted for different horsepower, at $8, $10 and $12. Write today.

MINERVA HARDWARE MFG. COMPANY
Minerva, Ohio

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70% MORE TIRE MILES

WIRE McCUE WHEELS

Car Races 956 Miles Without One Tire Change



AS RATHER convincing evidence of what wire wheels can accomplish in the way of saving tire wear, we submit herewith the story of the Mathias racer, pictured above.

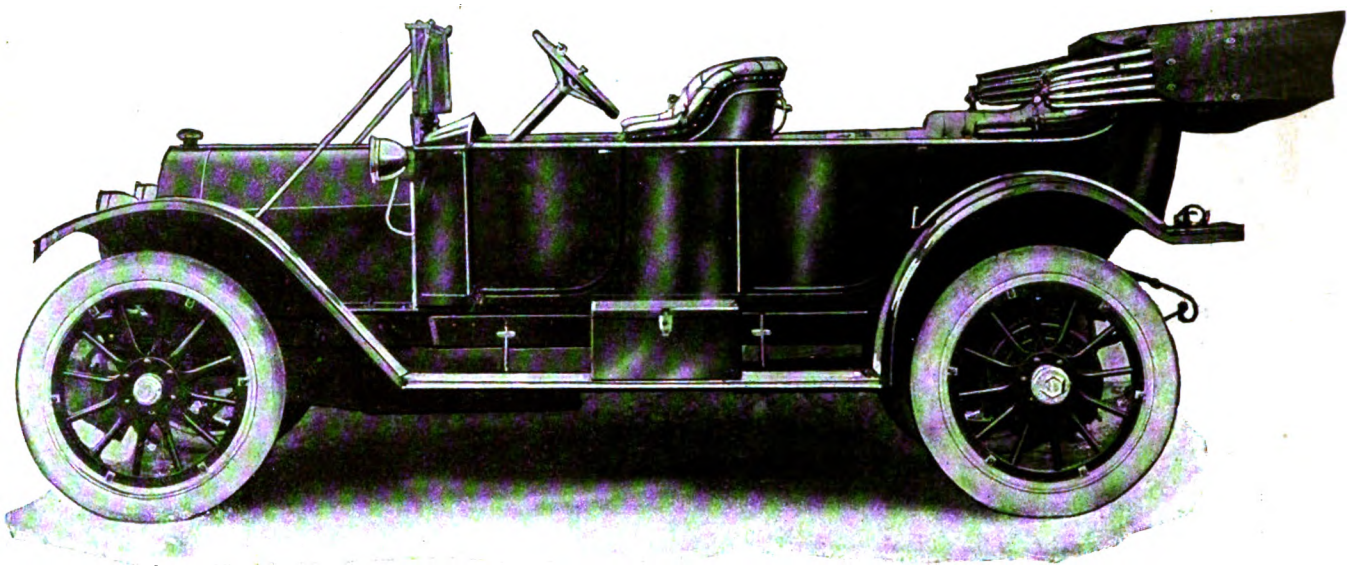
This car, which is the product of the Mathias Motors of London, covered the entire Grand Prix Course of 956 miles, without making one single tire change. It is true enough that the Mathias is not one of the real big cars, but for any car to maintain its speed over a prepared course under racing conditions without one single tire change is little short of marvelous. So far as records are obtainable, this is the first time that this feat has been accomplished in a race of this length. That wire wheels played an important part in so conserving tire life as to permit of this record performance, goes without saying.

In America, too, this tire saving propensity of wire wheels is only serving to intensify the popular demand for wire wheels, and the wise dealer and manufacturer is working his hardest to bring about the adoption of this equipment on the cars in which they are interested.

McCue axles are so constructed as to admit of the use of either wire wheels or wooden wheels on the same spindle.

THE McCUE COMPANY Buffalo New York

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When You Sell Your Full Allotmen

You Are Happy

In our advertising to the TRADE we have purposely omitted detail specifications, equipment, material, comparisons, etc. We do not believe that GOOD DEALERS are closed that way.

Some Manufacturers building from 10,000 cars up have from one to three thousand DEALERS—whereas the PULLMAN COMPANY will build but 1500 cars for 1913 and we cannot possibly consider over 100 DEALERS. Our present DEALERS will take 1000 PULLMANS—leaving but 500 for new territory.

As a Possible Pullman Dealer You Should Be Interested

We recently closed with an AGENT in a new territory—new for PULLMAN CARS, although we have been forced to refuse "applications" from this particular territory three straight years. The Dealer was sure he could sell fifteen cars—we allotted him that amount, and the fifteen were sold almost in advance—Pullman buyers waiting—and in a new territory.

Pretty good evidence of the PULLMAN SALES MAKING MACHINERY. It means more to the DEALER than double the ordinary DEALER'S DISCOUNT. Some Dealers sell as high as fifty cars a year and show little or no profit, and it isn't because of his discounts or the demand. Briefly, it's lost energy, haphazard selling methods, individual effort, etc. WE REDUCE THE PULLMAN AGENT'S selling "over-head" to a point where competition ceases to exist. We select your possible purchaser in advance, get you in touch and practically "cinch" the sale.

IF YOUR TERRITORY IS OPEN, WE CAN INTEREST YOU. BUT ACT QUICKLY. Wherever introduced Pullman cars dominate the territory.

4-36	4-44	6-66
$1675	$2150	$2750

Pullman Motor Car Co., York, Pa

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1/4 MILLION

EXHAUST TUBES IN TWELVE MONTHS

We made this enormous quantity because we received orders for them. We received orders for them because we can make them better, cheaper and quicker than any one else.

We make them better because we have the most up-to-date machinery and employ only expert workmen.

We make them cheaper because we make our own tubing and make so many.

We make them quicker because we know how to make them and do not fuss, fret or fume if the job is new or a "sticker."

Our tubes are strong, accurate to dimensions and very light in weight.

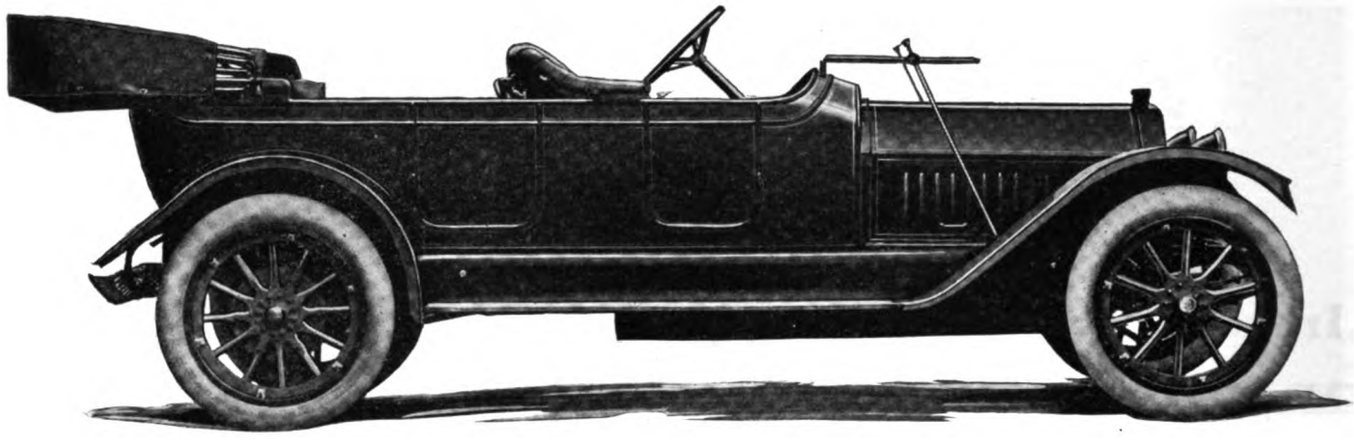
It is not foolish to make your own tubes, but it's futile, especially when you can get what you want without wandering.

THE STANDARD WELDING CO.

OLEVELAND, OHIO

NEW YORK OHICAGO DETROIT

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Specifications for the $2600 Little Six Premier

MOTOR—Six cylinders, cast in triplets, T-head type conventional among high-grade cars, valves on opposite sides, bore 4 inches, stroke 5 inches.

POSITIVE STARTER—The New Six Premier carries the most positive starting device that has up to this time been developed. It is of the pneumatic type sufficiently powerful to spin the motor at high speed, thereby producing sufficient pull to lift the gases in coldest weather. It is not necessary to run the car to charge the compression tank, which operation is noiseless. This eliminates the greatest inconvenience of modern motoring. It is only necessary to press the button to start.

TIRE INFLATOR—Premier equipment of Firestone demountable rims where extra tires can be carried filled with air greatly reduced the inconvenience resulting from the punctured tire, but with the New Little Six Premier this is entirely eliminated by the addition of a tire inflator which has sufficient capacity to at all times supply compressed air for the inflation of your own or the other fellow's tires.

ELECTRIC LIGHTS—Electric lighted throughout by a special generator, a simple, uncomplicated, automatically-controlled, generating unit which has nothing whatever to do with the ignition system.

IGNITION—Conventional imported dual high tension.

LUBRICATION—Constant level circulating system, dash sight feed, grease and oil cups.

COOLING—Water, gear-driven centrifugal pump, cellular radiator, six blade flat-belt-driven fan, large integral water jackets.

CLUTCH—Multiple disc, cork inserts, running in oil.

TRANSMISSION—Selective sliding gears, three speeds forward, one reverse, direct on high, five imported annular bearings.

DRIVE—Propeller shaft, through two combination slip and universal joints, bevel gears, ball joint spring cushion torsion tube, bevel gear differential.

REAR AXLE—Internally ribbed center housing, semi-floating live axle; four imported annular, two imported thrust, two roller bearings.

FRONT AXLE—I-section drop forging, without welds, spring seats integral, Elliott type, four roller bearings in wheels, two imported ball bearings in knuckles.

FRAME—Pressed-steel, wide flanges, dropped frame reinforced by straight line steel secondary frame on which motor and transmission are mounted, strongly braced.

BRAKES—Four, all on rear wheels, 526 square inches surface, brake drum integral with wheel hub, internal metal shoes fiber lined, external fiber-lined bands.

SPRINGS—Front, semi-elliptic, 36 inches long; rear, three-quarters deep scroll elliptic, with shackled ends, lower half 50 inches, with shock absorbers in rear.

STEERING—Irreversible, worm and full gear.

WHEEL BASE—132 inches.

TREAD—56½ inches Standard (60 inches optional).

GASOLINE CAPACITY—24 gallons.

WEIGHT—3,400 pounds.

TIRES—36 x 4½; Goodrich (regular), Diamond or Firestone (optional).

WHEELS—36-inch front and rear, with Firestone Q. D. demountable rims.

BODIES—Vestibuled Touring, Clubman, Roadster, Limousine and Berlin, two to seven passenger. They are deep and wide in the driver's compartment and are designed to care for the comfort of large men. The tonneau is also exceptionally large, making a roomy car comfortably seating five.

The upholstering, which is of great depth and luxury, the divan cushions being eleven inches deep, is of high grade hand-buffed leather, and curled white hair.

SPEEDOMETER—Trip, grade, speed and odometer. Electric lighted.

ADDITIONAL EQUIPMENT — Foot rail, robe rail, foot accelerator, muffler cut-out, shock absorbers on rear springs, one extra Firestone rim, tire irons, jack and tools.

ENCLOSED CARS—Interior furnishings complete, other equipment same as touring car.

PRICE—$2600 without top and windshield. F.O.B. Indianapolis.

Premier Price is from $2600 to $4000 for Touring Cars, Limousine Berlin Coupe and De Luxe to $5000

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50% gone

Already over 50 per cent of the season's output contracted for and applications in hand for more than half the remaining

$2600 LITTLE SIX
PREMIER

which is proving the greatest proposition of the year

THE trade has recognized the great selling situation which has been created in setting a new standard of price among the leading five builders of high grade automobiles.

They immediately realized the possibilities to them in dollars and cents of a Six Cylinder Premier car, pneumatic-starting, tire-inflating, 132-inch wheel base, luxuriously upholstered, handsomely finished and beautifully designed, listing at $2600.

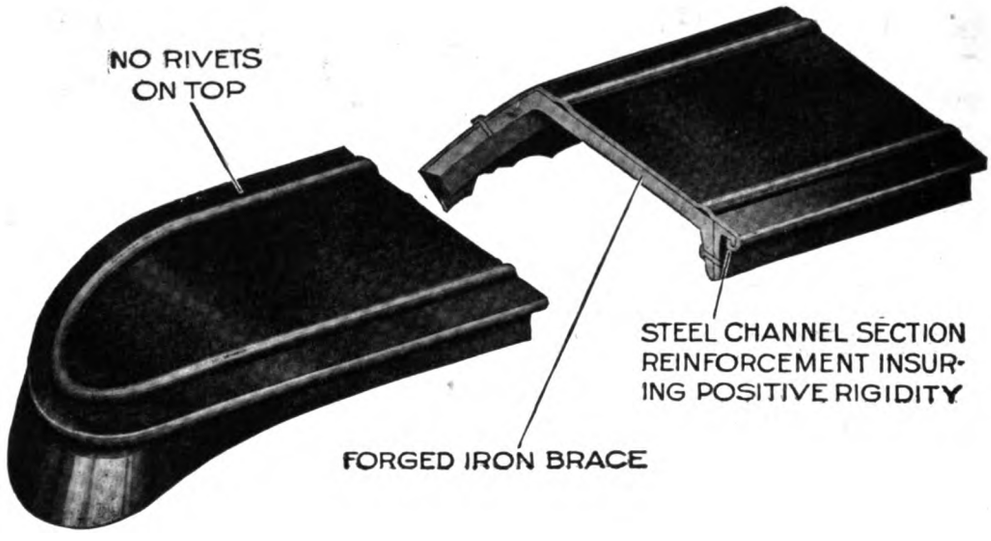
THIS PREMIER will be the greatest money-maker of the year for the dealer and perhaps you can share some of this prosperity. If interested, wire. Your territory may still be open.

Premier Motor Manufacturing Company Indianapolis

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Ask the HAYES Organization About It

They Make Everything in Sheet Metal



Ask the Hayes organization about your Sheet Metal problems.

They make

- **Bodies**
- **Fenders**
- **Running Boards**
- **Shields**
- **Dashes**
- **Shrouds**
- **Gasoline Tanks**
- **Tool**
- **Battery**
- **Prest-O-Lite**
- **Boxes**
- **Aprons**
- **Mufflers**
- **Etc., Etc.**

They make bodies, running boards, shields, shrouds, gasoline tanks, tool, battery and Prest-O-Lite boxes, aprons, mufflers, etc., and all-metal and wood-metal automobile bodies.

The Hayes engineering staff will gladly give you expert advice, go over your blue prints for you, point out the short cuts to a cheaper production, smooth out the wrinkles, and, if you desire, take the entire problem off your hands.

Furthermore, Hayes will absolutely guarantee delivery and give you prices below your own estimated cost of production.

Two highly-specialized and splendidly equipped plants, and the fact that we are the largest sheet metal users in the world, makes it possible and practicable.

Hayes Manufacturing Co.

DETROIT MICHIGAN

Manufacturers of Everything in Sheet Metal for the Automobile.

Manufacturers using Hayes all-metal or wood-metal automobile bodies find it to their advantage to have bodies and fenders shipped together. It prevents a possible shortage, and insures a perfect assembling.

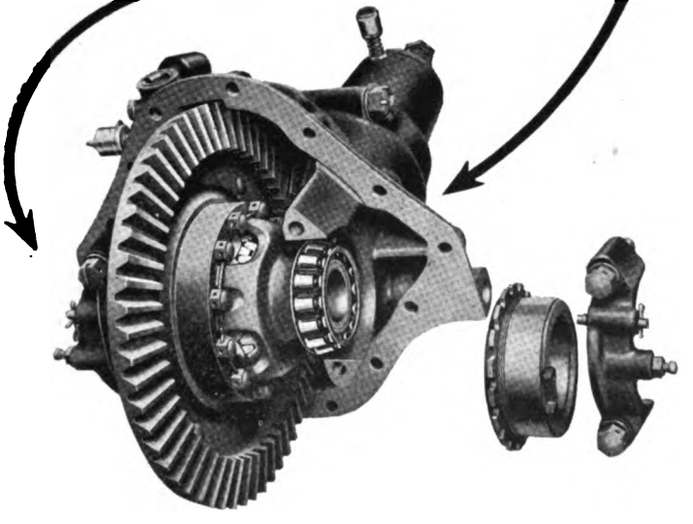
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It's the Power that Gets to the Wheels that Counts.

TIMKEN
BEARINGS & AXLES

The picture below shows the power-transmitting unit of a Timken-Detroit Rear Axle. Its accurately ground gears are kept always in perfect mesh by Timken Tapered Roller Bearings



The engine *supplies* the power for your motor car—yes—

But that power must be *transmitted.*

Some of it is bound to be lost unless the gears in your rear-axle are *always* in perfect mesh—

Timken Tapered Roller Bearings *keep* gears in perfect mesh—

Because they are adjustable.

When wear comes—as it will in any gears or any bearings—shafts drop slightly out of line, gears get slightly out of mesh.

With Timken Bearings you can wholly correct this wear, and prevent the loss of power.

Because the adjustment of Timken bearings does *two* things:—

It takes up the very minute wear in the bearings themselves.

It takes up all wear that may occur in the gears.

With non-adjustable bearings the wear becomes greater and greater—loss of power increases steadily. And the only remedy is complete replacement of such bearings—*after* you have borne the cost of the power that is lost.

Timken Tapered Roller Bearings make for comfort and satisfaction in driving—and for every last mile from each gallon of gasoline.

You can get the whole story of axle and bearing importance and construction by writing to either address below for the Timken Primers, T-1 "On the Care and Character of Bearings," and T-2, "On the Anatomy of Automobile Axles."

THE TIMKEN ROLLER BEARING CO.
Canton, Ohio
THE TIMKEN-DETROIT AXLE CO.
Detroit, Mich.

For more than fourteen years the Timken Roller Bearing Axle (made at Canton, Ohio) has been giving satisfactory service in horse-drawn vehicles

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EXPERIENCE — SHELDON — RIGHT DESIGN
FACILITIES — AXLES — RIGHT STEEL

"Made in the Largest Axle Factory in the World"

Axle Talk—No. XV

No other concern can undersell SHELDON products—efficiency considered, and this is said advisedly, because initial cost of an axle or spring should not be a matter for first consideration.

A truck manufacturer wouldn't consider an axle made of gray cast iron—just because it was cheap. He wouldn't dare do it—and still there does come a point in axle selection when steel quality and construction methods are sometimes set aside and cost of equipment, regardless of quality, is made the first consideration.

And this is right where the expert designer and the economically inclined purchasing agent begin to "split hairs."

In such a case the SHELDON Axle Company might lose out, just because they sell axle service and efficiency principally, and the axle incidentally.

It is obvious, however, that truck manufacturers are more and more adopting the "buying-service" principle—a fact well established when attention is again called to the claim that SHELDON axles are stock equipment on seventy-five per cent of all the commercial cars made in America.

We have an engineering staff and a plant worthy of careful investigation.

SHELDON AXLE COMPANY, Wilkes-Barre, Pa.

CHICAGO OFFICE—68 East 12th St. DETROIT OFFICE—1215 Woodward Ave.

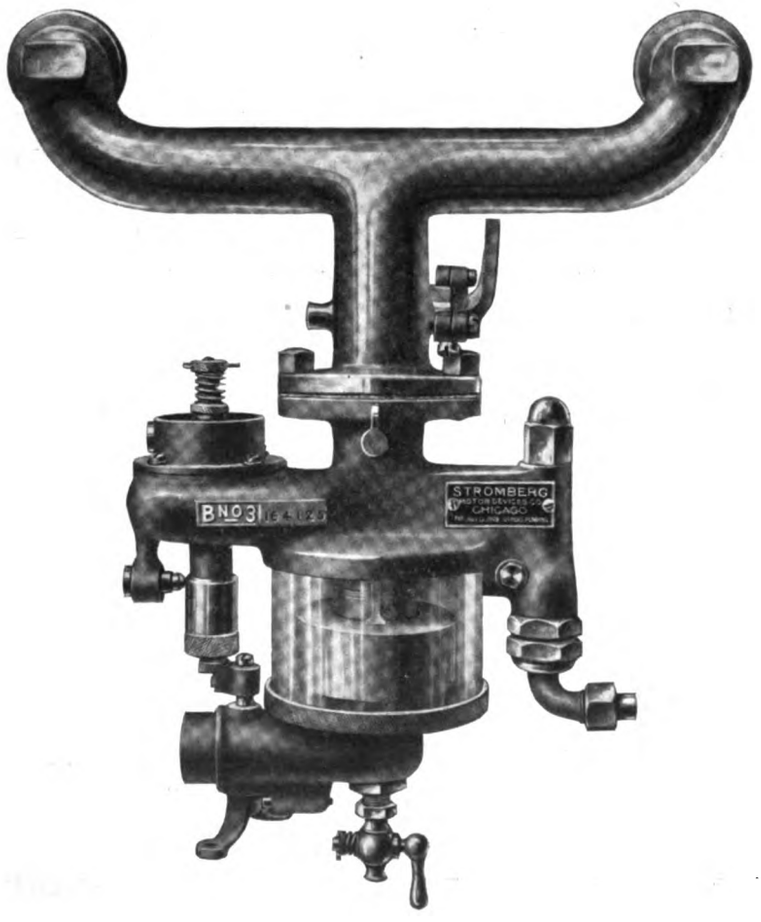
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New STROMBERG for Ford Cars

TO meet the demand from Ford owners for a complete Stromberg equipment at a reasonable price we have established a special department to make nothing but Stromberg Carburetors and manifolds for Ford automobiles.

Our increased and specialized production in this new department now enables us to offer our latest improved Type B 3 Stromberg with Ford manifold, ready for installation, at the remarkably low price of $20.75.

This new carburetor is even more economical than our old type B 3, and is made with the same care and skill as are all our various other models.



Inasmuch as we are already feeling the effects of the demand for this new model, we would request that you get your order in at once so as to get an early delivery and thus receive the benefits and enjoyments that accrue with the use of a Stromberg Carburetor.

Stromberg Motor Devices Company
69 East Twenty-fifth Street
CHICAGO, ILLINOIS

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JENCICK

QUALITY MOTORS FOR HIGH GRADE TRUCKS



This and forthcoming advertising will tell a good many interested truck manufacturers why we will not get into the "competitive price ring" with the builders of ordinary engines.

As a result of a recent very small advertising campaign, we received inquiries which, if all turned into orders, would have aggregated about $2,000,000. In this advertising we dwelt on quality in a general, but not in an analytical way.

We were not surprised to find that we could do business with only a small percentage of those interested. The reason of our failure was right there in cold figures—the other engine builders went way under us in price, and the concerns we didn't connect with, were those who were evidently holding cost of production low, regardless of future engine trouble and failure, which after all, would be the ugly heritage of the fellow who bought the car—not the man who made it.

The difference in cost of production will make interesting reading for the designer concerning, as it does largely, cost of material and, in a smaller way, methods of manufacture.

Special features briefly noted here will be shown in future advertising in a way that ought to make truck manufacturers, who are building for the future, get together with us on this all-important engine question.

Jencick Engines Have

Manganese bronze bases—costing three times as much to produce as aluminum or cast iron bases—and seven times as strong.

Krupp chrome steel, oil hardened crank shaft, with a tensile strength of 135,000 pounds and elastic limit of 114,000 pounds.

All small bearings annular—plain bearings only on piston pins (of bronze) and connecting rod and crank shaft bearings (Parsons white brass).

Semi-steel cylinders and pistons, close grained and hard—giving wear and a saving of foot pounds running into millions.

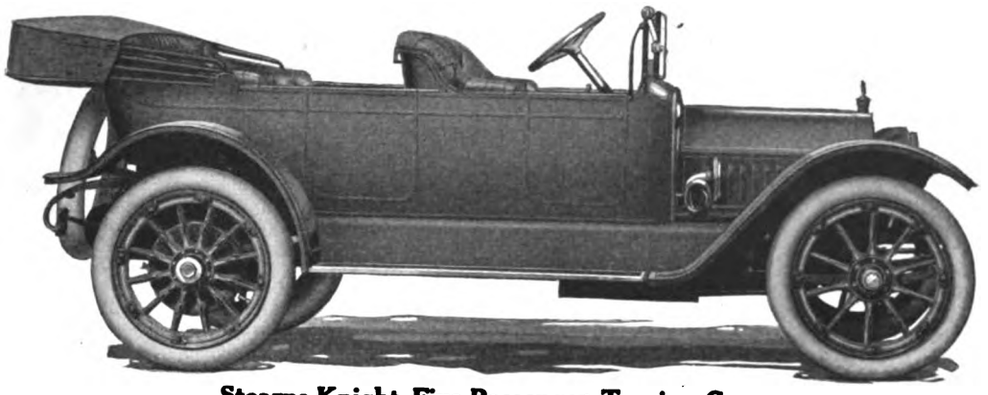
Integral cam shafts—a single casting of shaft and cams instead of keying the separate units—a radical refinement that means much. Instead of thirteen pieces on a four cylinder and nineteen on a six cylinder, there is but one, mounted on imported annular bearings giving everlasting life.

These are but a few of the radically different and better features that go to make the strong, durable and trouble-defying Jencick motor. The detailed "Reasons Why" which you may have now if you will write, will be dwelt with extensively in this paper.

JENCICK MOTOR CORPORATION, PORTCHESTER, N. Y.

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Announcing The New
STEARNS-KNIGHT

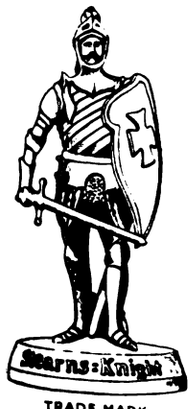


Stearns-Knight Five-Passenger Touring Car

The New Stearns-Knight Models

Chassis in Lead	$3400 and $3500
Five-Passenger Touring Car	3750
Seven-Passenger Touring Car	3900
Four-Passenger Light Touring Car	3750
Three-Passenger Roadster	3750
Limousine	5000
Landaulet	5100

All Stearns models are completely equipped with self-cranking device, Warner Auto-meter, windshield, electric generator lighting system, Klaxon horn, bulb horn, silk mohair top and slip cover, Q. D. demountable rims (two extra rims), muffler cut-out, robe-rail, foot-rest, tire carrier, complete tool and tire repair equipment.



TRADE MARK COPYRIGHTED

An increased output enables this company to open up considerable territory this year. Contracts are now being closed.

THE F. B. STEARNS CO.

12963 Euclid Ave. Cleveland Ohio, U.S.A.

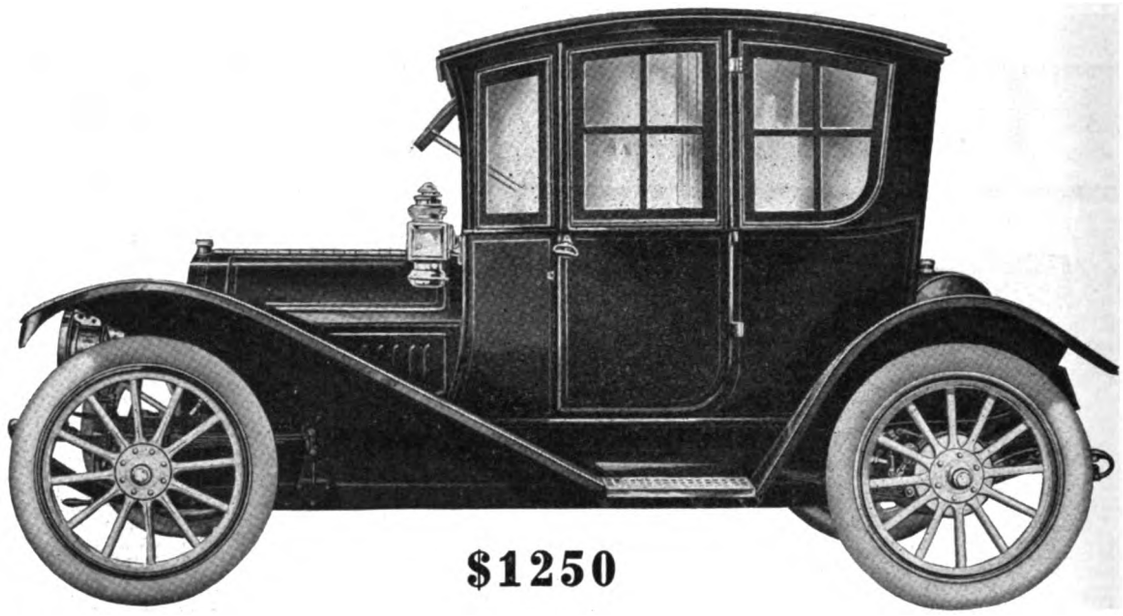
Branches and Dealers in 125 Cities



TRADE MARK COPYRIGHTED

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The Car With The "Talking Points"



$1250

The Regal "25" Colonial "Underslung" Coupe

EVERY TOWN AND CITY in the country have their automobile dealers who sell this or that line of cars. Some dealers are more successful than others because they happen to be handling cars that catch the public fancy, but all dealers, who have had experience, know that the automobile business has grown more and more competitive and that success depends upon the kind and quality of cars represented.

FORTUNATE FOR THAT DEALER who can declare: "I handle a line of cars that are not only distinctive in design, exceptional in quality and low in price, but embody 'talking points' of superiority that make the task of selling them a profitable pleasure." That there is a line of cars which the dealer can demonstrate to posses these "big selling" qualifications, and thousands of owners sustain, we can readily prove.

FOR INSTANCE—the illustration at the top of this advertisement represents a Regal Colonial Underslung Coupe with so many "talking points" that it is easily the biggest seller of any coupe upon the market. In other words, it offers so many qualifications of real car interest to the man who wants a Coupe that he simply cannot do his knowledge of automobiles and his pocketbook justice to buy any other.

"TALKING POINTS" are after all, nothing more or less than superiorities, whether of design, construction, usefulness, or a moderate price. We will emphasize these in their order just for argument's sake—because we desire the reader to know that there are many and substantial reasons why this Regal "25" Colonial Underslung Coupe is acknowledged everywhere not only the most beautiful coupe on four wheels, but also the most popular with buyers.

DESIGN—Looking at this car or sitting at its wheel affords a pleasure to the eye and a comfort to the body that is exceptional. Outwardly, there is a compactness, a unity of graceful lines, a distinctive sort of beauty immediately suggesting that here is truly a "different" car. The interior adds to the exterior a richness of comfortable environment that is a clinching argument for the customer examining it. Electrically lighted, roomy, richly upholstered. well ventilated, accessible for entry or egress it is indeed a Coupe with more selling points than any other.

CONSTRUCTION—"Underslung" construction and the Colonial Body is the perfect mating of chassis and Body. All the coveted and desirable elements of "safety" from skidding and "turning turtle," economy of power and upkeep, smooth riding ability and perfect accessibility to every vital unit, is here supremely emphasized. There are at least 50% more "talking points" to a Regal "Underslung" than any ordinary constructed car. Costlier to build, advanced in purpose to give the owner protection from accident and insure greater comfort, "Underslung" construction is the "coming" construction, old in practice by the world's most famous engineers, but new as applied to automobiles—giving a flat underbody and as much road clearance or more than by ordinary construction.

USEFULNESS—To the Dealer the Regal "25" Underslung Coloniol Coupe offers all the year 'round business. It is such a useful car because for $150 a Roadster Body can be supplied, making an up-to-date car for Summer or Winter. It is such a popular car because of its all year 'round serviceability. Doctors are enthusiastic over this Coupe. It ideally meets every need of their profession. Ladies desire it, not only for its good looks, but for its luxury. And women, now-a-days, have much to say about the car their husbands buy. There are a lot of reasons, did space permit, we could advance as causes of the tremendous sales of this car.

MODERATE PRICE—In critically examining the "talking points" of this Regal Underslung Coupe, in comparing it with other Coupes, in demonstrating its superior "riding abilities," in acknowledging its beauty, and summing up the acknowledged advantages of Underslung Construction, you will agree that at the price consideration of $1400 it is a car that you can readily and proudly represent. It has demonstrated its ability to outsell all competing cars; it has proved itself the car the public wants and the one Coupe that is superlatively distinctive. It is a continuous pleasure for the buyer and a winner for the dealer.

SOME COLONIAL COUPE SPECIFICATIONS—Motor 25 H.P., 3¾ x 4½; Wheel base 100 inches; Magneto and Batteries (dual ignition); Transmission (Selective); Hyatt Roller Bearings throughout Transmission and Axles; Three speeds forward, one reverse; Morgan & Wright Tires, 32 x 3½; Standard Equipment; Five Lamps; Generator; Horn; Complete Tool Equipment.

OTHER REGAL "UNDERSLUNGS"—Regal "25" Underslung Touring Car, $950. (The talk of New York and Chicago Shows); the famous Regal "35" Underslung Touring Car, $1400. Regal Roadster, Model "N," $900.00.

Regal Motor Car Company, Automobile Manufacturers **Detroit, Mich.**

FOREIGN DEPARTMENT—18 Broadway, New York

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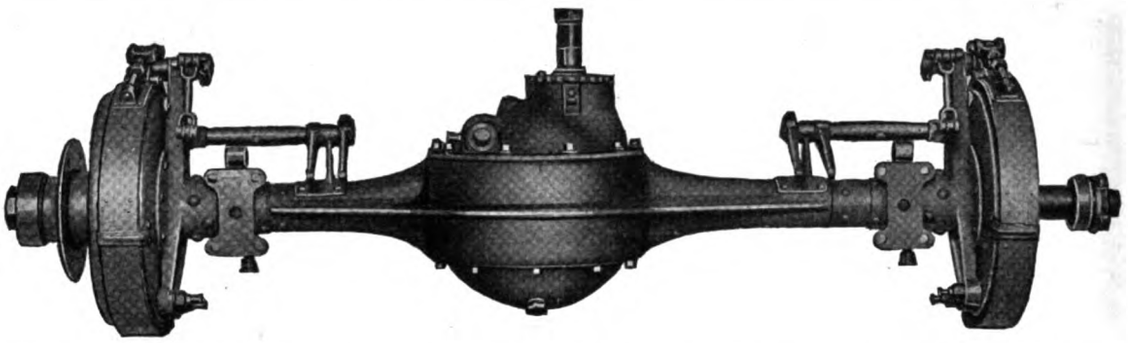
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American American

American Axles

It Is Only Ordinary

Economy to Demand Axle Perfection



Poor axles are robbers which intercept and consume the battery charge of your electric.

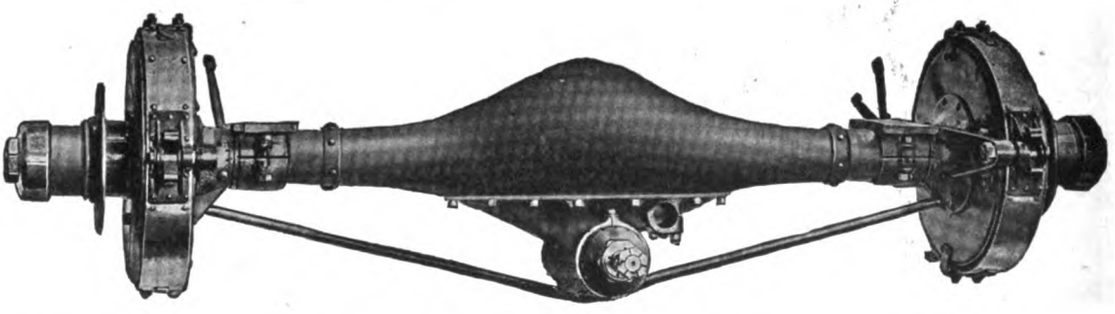
American Axles give the maximum flow of power because their construction insures the minimum of friction.

This is due to the superiority of their design and the excellence of our manufacturing processes.

You cannot find elsewhere the same features—features that your car should have—because they are covered by our basic patents.

The Bevel Drive Axle first used for electric vehicles was designed and manufactured by us, and we have brought it to its present high state of refinement.

We can now offer you the option of the Lanchester-Daimler Worm Gear Axle, having the same superb qualities as to precision and design, as we hold the exclusive American rights to it as axle manufacturers through the Warner Gear Company, of Muncie, Ind.



THE AMERICAN BALL-BEARING CO.

Edgewater Park and L. S. & M. S. Ry. CLEVELAND, OHIO

American

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A TWITCHELL AIR-GAUGE at $1.00



No Motorist Would Hesitate a Moment

in buying the TWITCHELL AIR GAUGE if he knew it was going to save him a new set of tires. Tire expense is the motorist's kill-joy. Any device to effectively reduce that expense has a value out of all proportion to its cost.

Such a device is the TWITCHELL AIR GAUGE. With it the motorist has ever ready at hand a means to determine if his tires are inflated to the right pressure. If they are not, and he doesn't know it, he is on the high road to tire ruin. Because a tire which runs flat for even a few feet may be wrecked beyond repair.

THE TWITCHELL AIR GAUGE

tells you in one minute if your tires are in danger. Simply hold the gauge to your valve and the indicator informs you what your tire pressure is. A stop holds the indicator in place till you release it. On every gauge is a table of pressures different size tires require.

Price, $1.00 Each

Now ready for shipment. May be obtained at all dealers or direct from us.

THE TWITCHELL GAUGE CO.
1256 Michigan Blvd. CHICAGO, ILL.

or A NEW SET of TIRES at





Ask for Agency

Learn From the Book—Why the Glide is Best

If you are contemplating the purchase of an automobile you can make no mistake going to a "Glide" dealer. In the first place, a "Glide" dealer has a car that he can sell with absolute confidence and with the knowledge that the automobile will give

5 to 7 Years' Service

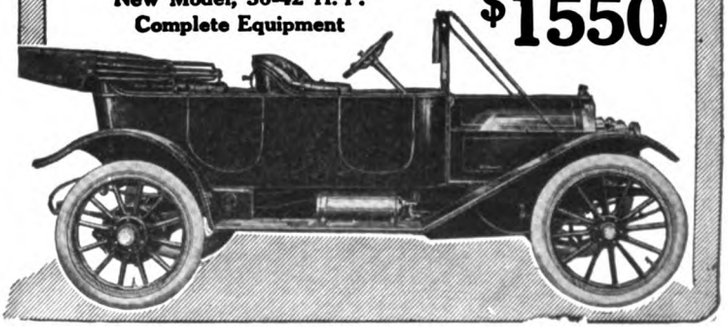
Then again he knows that his customer becomes the purchaser of a car that combines quality and price in a way that has never been equalled by any automobile manufacturer.

If these things count for anything—and they surely do—then the "Glide" has a perfect right to call itself the *best* car—and the best car is the car you want. You can learn all about the "Glide" and the *guarantee* back of it from the handsome book we send free to all those interested. Booklet pictures and describes full line including Two and Four Passenger 45 h. p. cars, $2,000; Five Passenger "45" $2,150; Seven Passenger, "45" $2,250.

To Dealers: We intend to establish a few new selling agencies in territories which are still open. Write for our proposition. The "Glide" has made good for other dealers—it will make good for you. Write for information today.

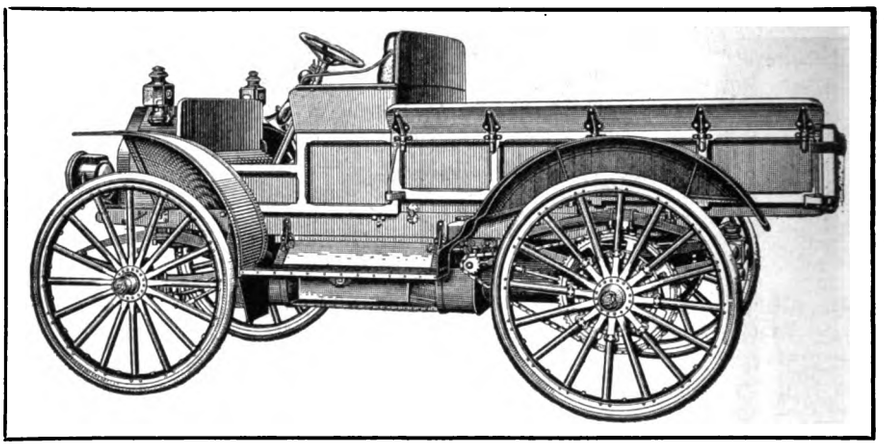
THE BARTHOLOMEW COMPANY
220 Glide Street Peoria, Ill.

New Model, 36-42 H. P. Complete Equipment **$1550**



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Every Business Man a Prospect



In an editorial a Chicago paper asks: "Who will give to the people of this country a strong, reliable, sane, really low priced car, a car that can be used as a delivery wagon in the week days and that can take the family out on Sunday, with an extra seat in the back?"

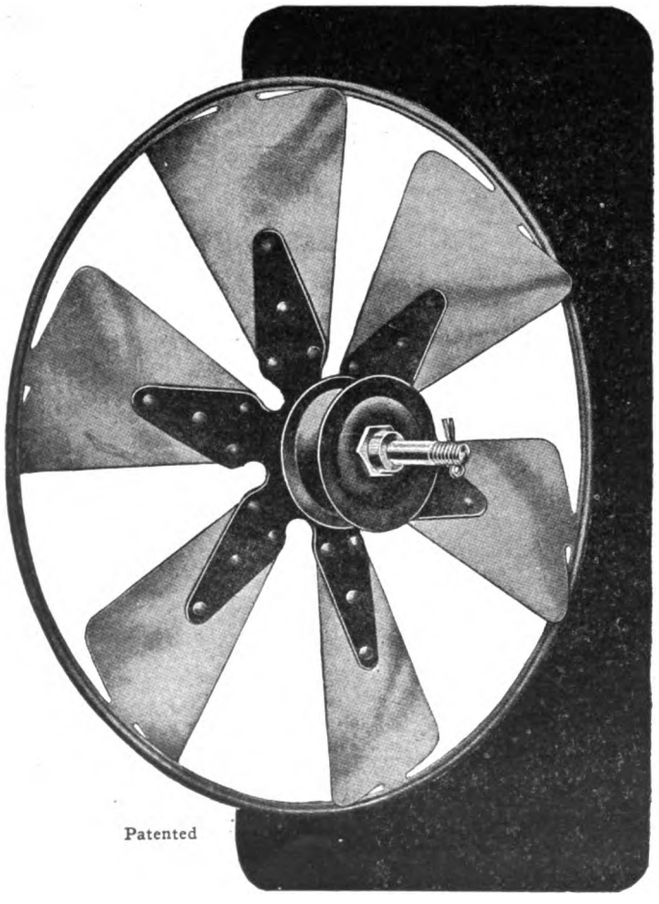
It is hardly possible to write a better description of the

International Commercial Car

than the one given in that paragraph. It is impossible to imagine a wider field for sales than the one offered by this car. "Farmers and truck gardeners, plumbers, carpenters, electricians, mechanics—each a man 'running his own machine' for the sake of his work on business days and for the pleasure of his family on Sundays"—to quote again from this paper. Add "men in every occupation" and you get a faint idea of the number of prospects there are in this country, for International Commercial Cars.

We help you to find prospects and make sales. A few more agents can secure territory by communicating with

INTERNATIONAL HARVESTER COMPANY OF AMERICA, Inc., 155 Harvester Bldg., Chicago, U. S. A.



Patented

Better Fans

We positively will give you a superior Radiator Fan. The Sparks-Withington Co. are the largest and most experienced Fan manufacturers. Recently added facilities now brings our capacity to

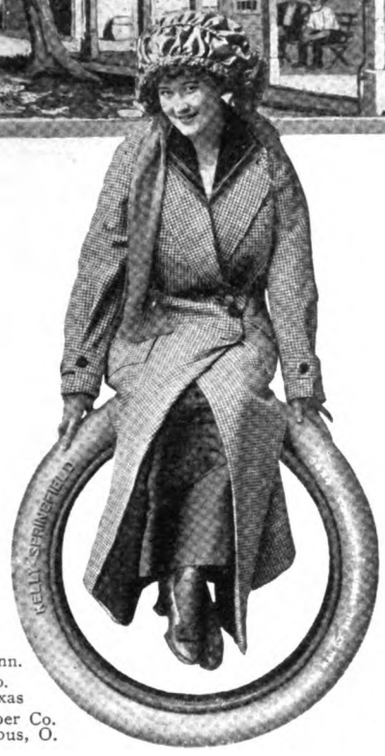
1,000 Fans Per Day

Standard sizes for all classes of cars.

THE SPARKS-WITHINGTON CO.
Jackson, Michigan and Walkerville, Canada

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Kelly-Springfield Tire Company
20 Vesey St., New York

Branch Offices in
New York
Chicago
Philadelphia
Boston
St. Louis
Detroit
Cincinnati
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Cleveland
Baltimore
Washington
Seattle
Atlanta
Akron, O.
Buffalo

Boss Rubber Co. Denver, Colo.
Appel & Burwell Rubber & Tire Co. Dallas, Texas
Todd Rubber Company New Haven, Conn.
Bering Tire & Rubber Co. Houston, Texas
The Hearn Tire & Rubber Co. Columbus, O.

Kelly-Springfield Automobile Tires

As long as pneumatic tires are made of rubber their serviceability will be determined by the quality of that rubber.

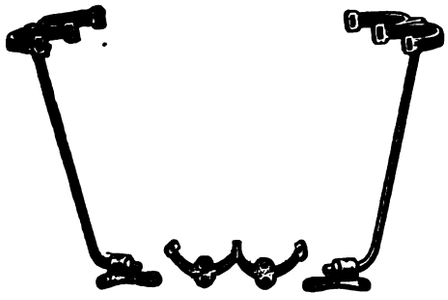
The average mileage of Kelly-Springfield Automobile Tires stands a thousand or two above the average mileage of the average tire. It ought to—for since 1895, when we started out as the first manufacturers of rubber vehicle tires, our experience has enabled us to develop for Kelly-Springfield Tires a tough, long wearing composition of rubber that is pretty close to perfection.

Kelly-Springfield Tire Company, 20 Vesey Street, New York

The Largest Antomobile Supply Honse in America

FIFTEEN STORES IN THE UNITED STATES

"Torpedo" Tire and Demountable Rim Holders



Designed especially for use on Torpedo body or Fore-door cars. Set consists of two strong arms firmly bolted to running board and permitting of sufficient adjustment to accommodate two tires or demountable rims, of standard sizes, 4 inch or smaller. Made of solid Brass and guaranteed to give perfect satisfaction.

Finish: Furnished in Hard Rubber Black Enamel finish, and full Polished Brass.

	Brass	Black
Price, complete with Straps...	$4.00	$3.00

A dozen other styles and sizes in stock. See catalog.

Our 1912 Catalog, which is held as a book of reference by manufacturers, dealers and automobile owners, will be mailed on request. Circulation limited to 100,000 copies.

Chas. E. Miller

MANUFACTURER, JOBBER, EXPORTER AND IMPORTER

HOME OFFICE

97-99-101-103 Reade St., New York City

ORDER FROM NEAREST BRANCH, ADDRESS CHAS. E. MILLER

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NEW YORK CITY—924 Eighth Ave.
NEW YORK CITY—2782 Broadway.
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NEW ORLEANS, LA.—601-603 Barrone St.
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SPRINGFIELD, MASS.—Bridge and Dwight Sts.

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Any "Doubting Thomas'" as to the quantity and quality of Motor World's circulation can be transformed into "Thomas convinced" by a sworn to guaranteed circulation statement sent upon request promptly.



Have You Tried Them?

Four corps of experts working in four of the best equipped tire plants in the world are operating as a unit to produce

UNITED STATES TIRES

Nothing of the kind has ever before been attempted in automobile tire manufacturing.

United States Tire Company
New York

The Ford Water Circulator

forces the water from radiator through cylinder water jacket, maintaining rapid circulation when car is in motion. Write for descriptive matter if you handle Ford cars.

THE FULTON-McCUTCHAN CO.
1146 Michigan Ave. CHICAGO, ILL.

Mosler Spit-Fire Are The Best
A. R. MOSLER & CO.
163 WEST 29TH STREET
NEW YORK, N.Y.



MOTZ Cushion Tires
For Pleasure Cars and Light Delivery Cars
Send for Booklet 58
THE MOTZ TIRE AND RUBBER CO.
Executive Office: Akron, Ohio
BRANCHES:
2022 Michigan Ave., Chicago 920 Woodward Ave., Detroit
1727 Broadway, New York 620 E. 18th St., Kansas City
1409 Race St., Philadelphia 12202 Euclid Ave., Cleveland
200 N. Craig St., Pittsburg
Standard Tire & Rubber Co., 104-106 Portland St., Boston
Distributors for New England States

A—Shows double, notched treads.
B—Shows undercut sides.
C—Shows slantwise bridges.
D—Shows absorbing means when passing over an obstruction.

ARE YOU in need of any additional help in any department of your business? Are you out of employment or looking for a better connection? Have you second-hand apparatus of any kind or do you want to buy second-hand material? Have you a factory site for sale or do you want to buy one? If so, use the Want and For Sale column of the Motor World. Seven words to the line, fifteen cents a line. Advertisements can be inserted over a number when it is desired and identity of the advertiser will be kept confidential.

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Schafer Ball Bearings

as part of standard equipment puts the final O. K. of quality on the car, so far as bearings are concerned. They guarantee durability, and strength, far in excess of the promise or performance of the "ordinary" types.

Schafer Ball Bearings are made from chrome steel of exclusive analysis—true to within .0001 part of an inch —have no variance in size, shape or material—are free from blisters, air bubbles and other flaws.

"Schafer Ball Bearings make a good car better."

Barthel, Daly & Miller

42 Broadway, New York City

To tour in comfort

supplement your rear springs with a set of *real* shock absorbers—the

"J. M." Shock Absorbers



"J. M." Shock Absorbers not only take up the jolts and jars caused by rough, rutty roads—assuring perfect comfort; but they save largely on tire costs and engine repairs. **"J. M." Shock Absorbers** hold the driving wheels to the road as no other absorbers do—eliminating the "racing" of the engine when in the air, with consequent jolt on hitting the ground, and the grinding of tires at the same time.

Made in three models—attachable in one hour, detachable in 15 minutes. Prices, $35.00 to $50.00 per set.

Write on your business letterhead for booklet W and full information. Mention the name, model, weight, and width of rear springs on the car you run.

The "J. M." Shock Absorber Co.

Main Office and Factory:

210 South Seventeenth Street Philadelphia, Pa.

New York, N. Y., 218 W. 84th St.
Chicago, Ill., 1509 Michigan Ave.
Boston, Mass., 222 Eliot St.
Buffalo, N. Y., Teck Building
Rochester, N. Y., 111 Monroe Ave.
Detroit, Mich., 1001 Woodward Ave.
Pittsburgh, Pa., 5919 Baum Street
Baltimore, Md., 10 W. Eager St.
Washington, D. C., 1803 M St., N. W.
Pawtucket, R. I., 41 Dexter St.

Branches in France, England, Germany, Russia, Belgium, Austria, Italy, Spain Argentine Republic, South Africa and Australia

Dealers: Desirable Territory Still Open.

The Hotel of Comfort

The WOODSTOCK

"You can walk from there to anywhere"

Our new addition is ready for occupancy.
We now have 360 rooms with 265 baths.
Write us for descriptive folder with typical floor plan and rate card.
Wire for reservation at our expense.



RATES

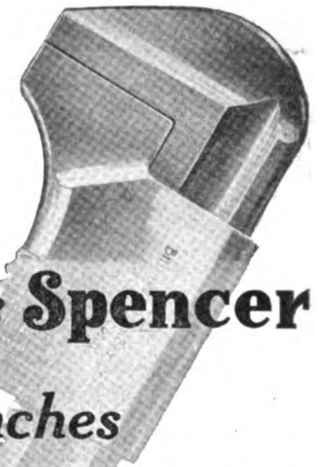
Court room with bath, for one, per day.....$2.50
Court room with bath, for two, per day..... 3.50
Outside room with bath for one, per day..... 3.00
Outside room with bath, for two, per day..... 4.00
Outside room with twin beds, for two, per day $4.00

HOTEL WOODSTOCK
127 W. 43d St.
New York

W. H. Valiquette, Manager.

Also
"THE BERWICK"
Rutland, Vermont

Drop-Forged Accurately Assembled



Billings & Spencer Wrenches

The few parts of a Billings and Spencer Wrench are put together with a micrometrical exactness.

None is permitted to leave the factory until it has passed the most rigid examination.

As a result, a defective Wrench is unknown to the man who insists upon getting the triangle trade-mark brand.

A guarantee of a lifetime of service is his further assurance of highest possible quality.

Look for the B. & S. trade-mark on the wrenches you buy. It is put there for your protection.

On sale everywhere. Write today for Catalog.

BILLINGS & SPENCER COMPANY
Hartford, Conn.

THE MARK OF QUALITY B THE BILLINGS & SPENCER CO. HARTFORD

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Self Starter HANNA

Watch the Prices Drop!

Just as the Hanna self starter—the only 100% efficient self starter that does not foul or soot your plugs—was imitated by those who followed our lead so now is the price of the Valentine manifold starter being met.

Remember We Were the Originators

Not only were we the first to produce an acetylene self starter but we were first to introduce a manifold self starter at the right price, $10.

Our Price Does Not Cut the Dealer's Profit

Still some fine territory open. The profit is big. Our goods are right and fully guaranteed. Write today.

J. H. VALENTINE COMPANY

Syracuse, New York

The Valentine STARTER MANIFOLD and Gas Lighter

INTERLOCK INNER TIRES

Stop Tire Troubles

INVESTIGATE AND LEARN WHY SO MANY THOUSANDS OF MOTORISTS ARE DISCARDING INNER SHOES, RELINERS, FILLERS, AND OTHER MAKESHIFTS FOR INTERLOCK INNER TIRES—AND WHY INTERLOCKS ARE HANDLED AND RECOMMENDED BY THE BEST SUPPLY DEALERS AND TIRE HOUSES ALL OVER THE COUNTRY.

One weak point of the automobile to-day is that you can't depend on its tires. INTERLOCKS revolutionize this condition by making your tires so strong that blowouts become practically impossible. INTERLOCKS save half your tire expense—save repair bills—double your mileage—prevent punctures and completely free you from all fear of tire trouble.

What INTERLOCKS Are.—The INTERLOCK is a complete inner tire (not an inner shoe) which is placed between the outer casing and the inner tube to strengthen the outer casing and protect the tube. It is the only reinforcement which is locked by air pressure to the rim and which becomes an integral part of the tires, and, therefore, cannot heat or chafe. Even if the tire is broken the INTERLOCK will hold.

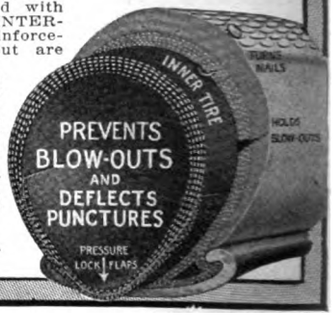
INTERLOCKS Insure Safety.—You know that the sudden blowing out of a tire may easily ditch any car when going at fair speed—the safety of INTERLOCKS should appeal to you.

Reduce Your Tire Expense.—You can have the tires on your new car equipped with INTERLOCKS if you specify them. INTERLOCKS are the only perfect tire reinforcement. They cost a little more but are cheapest in the long run.

For your present car—ask any dealer or supply house, or write to us for the name of your nearest supply source INTERLOCKS will make any fairly sound tire more than carry you through the season. They are easily placed and are made in all sizes.

We Want Dealers Everywhere.—Write for Special 30 Day Offer. Booklets, Prices, Records of Road Tests and Testimonials of users.

DOUBLE FABRIC TIRE CO.
600 W. 9th St. Auburn, Ind.



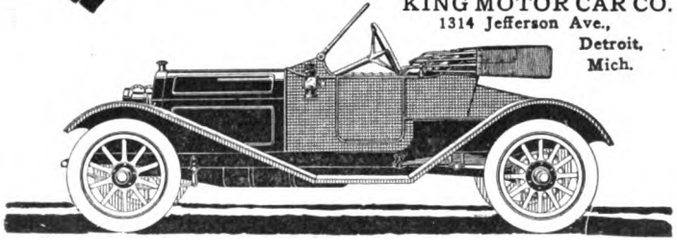
KING

The 1913 King Roadster is a perfectly balanced car. The long wheel base, with engine seated eight inches back of the front axle, gives perfect distribution of the load, and entire comfort to the passengers.

With Full Equipment, Including Self-Starter, **$1190**

Terms, territory and detailed description on request.

KING MOTOR CAR CO.
1314 Jefferson Ave., Detroit, Mich.



Abbott-Detroit

"The demand of the day is that an organization shall be judged by its product and not by what it claims for itself."

"BUILT FOR PERMANENCE and GUARANTEED FOR LIFE"

Models and Prices:

34-40	Fore-Door Roadster, 116-inch wheel base, **$1700**	**44-50**	7-Passenger, Fore-Door Touring, 121-inch wheel base, **$2000**
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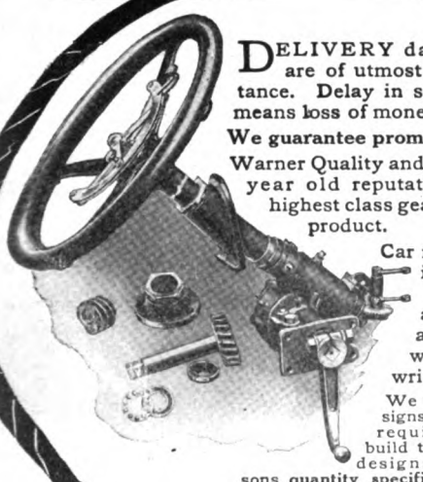
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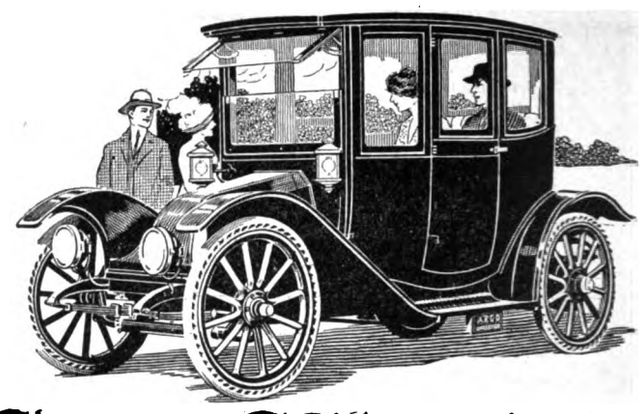
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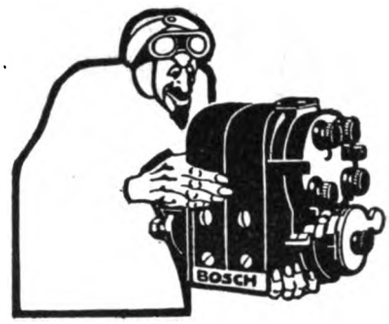
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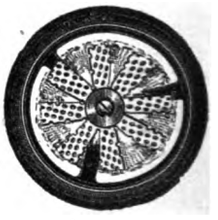
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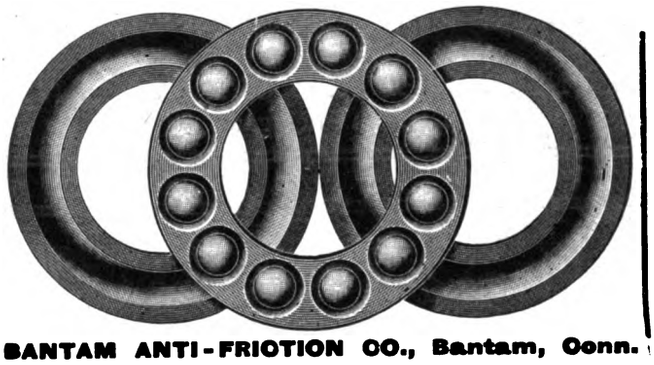
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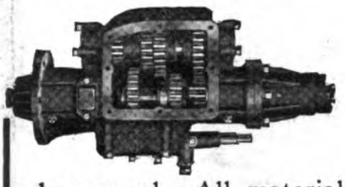
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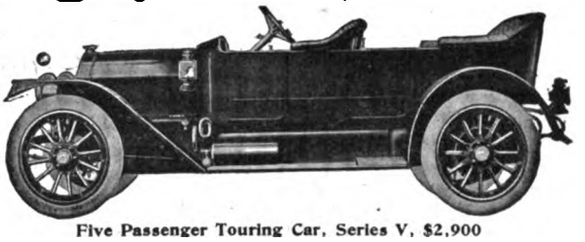


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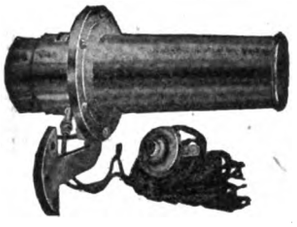
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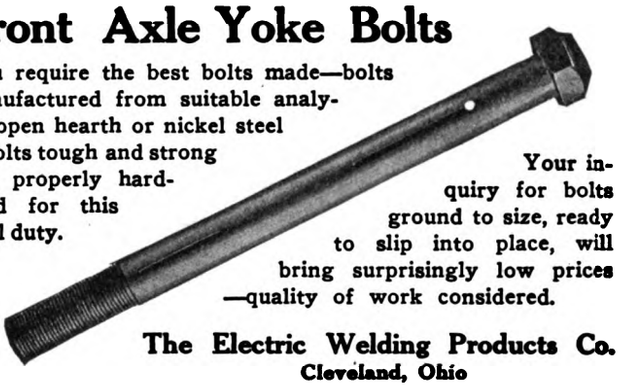


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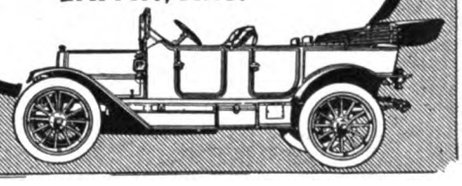
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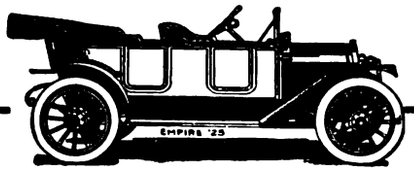
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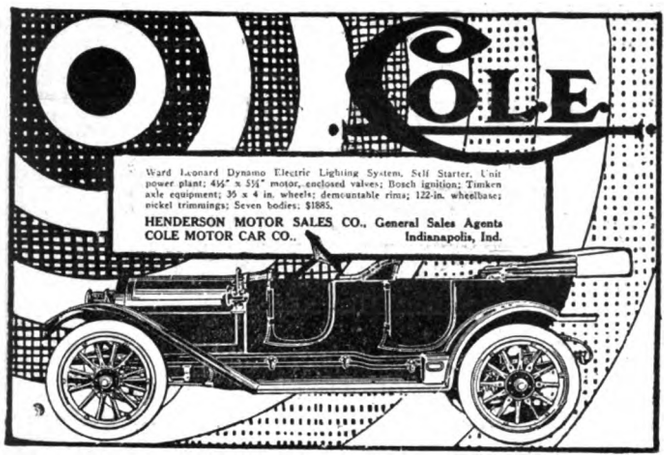
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Price $1850

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4 and 6 Cylinder Motors
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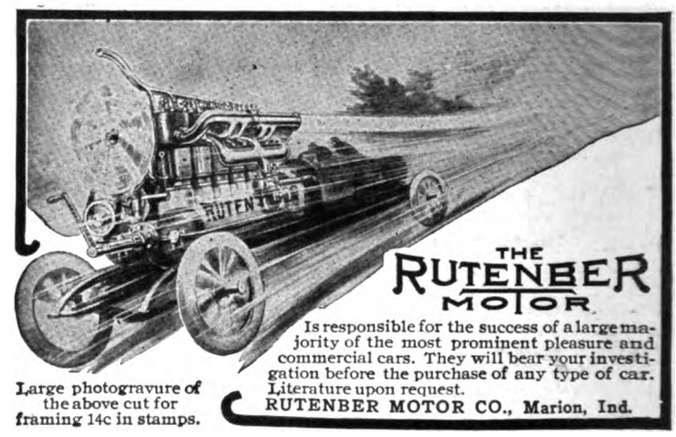
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Self-Starting
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One Quality in All Models

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Climbs a 50% grade—Friction Transmission—any number of speeds. Five models—write.

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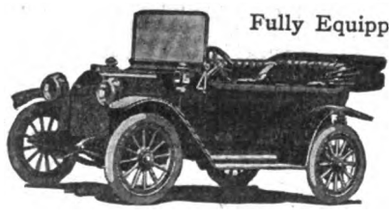
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25 H. P. Long Stroke Motor

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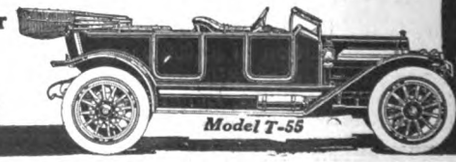
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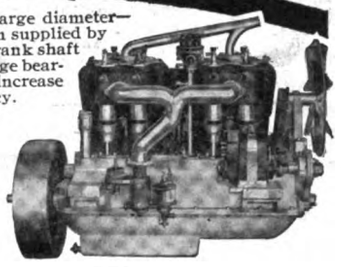
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We are determined to build the best all-'round five-passenger touring car in the world and sell it, completely equipped, for

$900.00

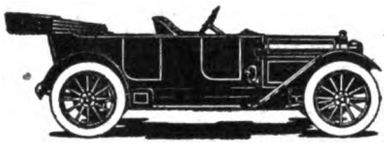
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Fully equipped with top, windshield, speedometer, gasoline gauge, 36" wheels, demountable rims, and automatic tire pump.

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Boston Branch: 153 Massachusetts Ave. Omaha Branch: 310 S. 19th St.

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STAGGARD TREAD TIRES and BLACK-LINE RED INNER TUBES



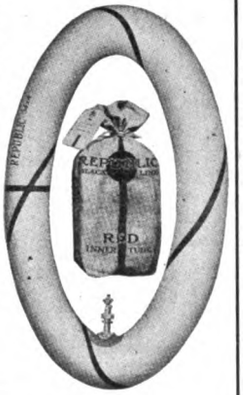
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Motorists who use Republic Staggard Tread Tires will tell you that they—Prevent skidding, make quick starts and short stops easy. Give double mileage because of the full-thickness tread under the studs.

Most Widely Imitated of All

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THE UNIVERSAL CAR

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Ideal for your motor, write for information booklet D
ATWATER-KENT MFG. WORKS
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Final and crowning achievement of R. E. Olds, pioneer designer of autos. A standard size 30 to 38 horsepower four cylinder car of modern refinements priced for the present at only $1,055.
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The most economical car you can buy at any price. The Metz will run from 28 to 32 miles on a gallon of gasoline, over 6,000 to 10,000 miles on a set of tires. You can lubricating oil, and from secure exclusive sale of these cars in your territory. Book "B" mailed free on request.
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Manufactured by
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The Great Anti-Skid DEVICE

Nine-tenths of all accidents to automobiles are caused by skidding or slipping.

Either you skid into the "other fellow" or the "other fellow" skids into you.

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Cannot Injure Tires
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An absolute necessity on both rear wheels and if you want to know what real steering steadiness means put them on the front wheels too.

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The Name "Weed" on Every Hook

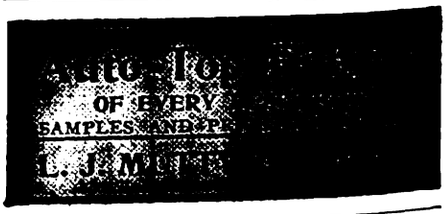
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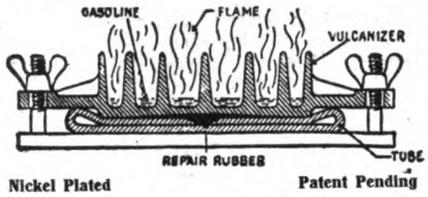
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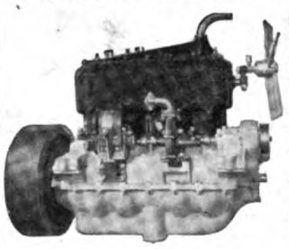
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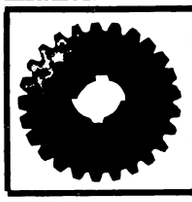
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They don't sell on sight, but
They do sell on sound.
Write for prices and circular.
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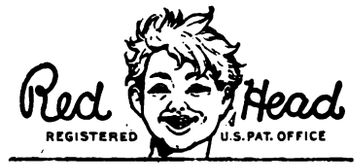


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Special features that eliminate speedometer troubles. Send for the booklet.

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Magneto Plugs coax maximum power out of engine.
EMIL GROSSMAN COMPANY, Mfr., New York and Detroit



Tones down headlights for city driving and foggy nights—an auto necessity. Price 75c. per pair. Sell like hot cakes. Dealers, secure the agency quick.

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New Departure Guaranteed Ball Bearings

are in 60% of the 1912 cars. Contracts for 1912 cover 80% of the entire output of American automobile manufacturers next year. Reason—New Departure Ball Bearings have "made good." Have you had our 1912 catalog?

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Western Branch: 1016-17 Ford Building, Detroit

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15 cents per line of six words, cash with order: — In capitals, 25 cents per line —

A market place where Dealers, Jobbers and Manufacturers may buy, sell or trade used cars, parts and appliances and where help or situations may be secured at a nominal cost.

FOR SALE—At a bargain, a 7-passenger Pope-Hartford, just like new, been run 1,100 miles. Address, DR. GEORGE W. ALLEN, Rockville, Conn.

I WILL SELL Panhard, 18 H.P.; motor under driver's seat; write for appointments evenings. J. WILSON, 879 6th Ave., New York City.

SALESMAN—(29), considerable ability, 8 years outside experience, desires connection with motor truck, automobile or accessories company, or would represent out of town concern as agent or manager. Address, BOX 212, care Motor World.

LIST FORD OWNERS for U. S. and other makes of cars. Complete lists, 5,000 names, $2.50. OWNERS AUTO LIST COMPANY, Albany, N. Y.

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SALESMEN, one who is now visiting automobile trade or owners. Good money made on a very attractive proposition. STURDY MFG. CO., 2637 Michigan Ave., Chicago, Ill.

FOR SALE—Fully equipped plant for the manufacture of vehicles and automobile bodies, located at 28 to 32 Bank street, Trenton, New Jersey, and occupied by the FitzGibbon & Crisp Carriage and Wagon Co. Buildings consisting of four-story main factory, three-story trimming and store house, blacksmith shop, lumber sheds, etc. A live going proposition doing a large business in vehicles and automobile bodies, to be sold at Receiver's Sale on August 23rd, 1912, at 2 P. M., on the premises. JAMES C. TATTERSALL, Receiver.

FOR SALE—Columbia electric landaulet; recently overhauled and in good condition. Complete with Edison Charging Board. Price reasonable. Inquire P. MALI, 73 Fifth Ave., New York City.

FOR SALE—Dealer in new and second-hand automobiles; Ford runabout, 4 cyl., 26 H. P., top, windshield, rumble seat. Maxwell runabout. Oldsmobile, 4 cyl., top, 5-passenger, and windshield. Rambler, 2 cyl., top, 5-passenger, and delivery body, all in good condition. F. B. ARDRIE, 21 Carnes St., W. Lynn, Mass. P. S.—Wanted—to buy 50 automobiles.

WANTED—5 pass. car, 1911 or 1912 model; will trade 20 acres fruit land, Palm Beach Co., Florida. Address, BEN. H. HARMS, Platteville, Wis.

FOR SALE—6 cylinder Franklin engine, complete with magneto, carburetter, fine condition, $175.00. BOX 210, care Motor World.

FOR SALE—Touring car, 5-passenger, in excellent condition; price reasonable. Address P. O. Box 367, Springfield, Mass.

AUTOMOBILE Cylinders Reground, new pistons and rings fitted. Garage air compressors. CAST IRON BRAZING CO., Manchester, N. H.

FORD OWNERS, improve the appearance of your Fore Door Touring Car or Torpedo Runabout 50% for $3.25. Send postal for information. LINDELL AUTO SALES CO., 3444 Lindell Ave., St. Louis, Mo.

WE BOUGHT AT BARGAIN from bankrupt factory 500 fine mohair tops, $40.00 kind; will sell at $10.00 each cash, complete with curtains, covers and windshields. This price will move quick, so get your order in early. PURITAN MACHINE CO., 51-57 10th St., Detroit, Mich.

An ad. like this will cost you 75c. for each insertion.

Mr. Dealer

Just look over these announcements and see if they don't remind you of something which you want to buy or sell that you have been scratching your head about for some months.

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15 cents per line of six words, cash with order: — In capitals, 25 cents per line —

A market place where Dealers, Jobbers and Manufacturers may buy, sell or trade used cars, parts and appliances and where help or situations may be secured at a nominal cost.

MAILING LISTS—750,000 auto owners. S. H. CARROLL, JR., Albany, N. Y.

MOHAIR—DUCK—CANVAS—TOPS
PEERLESS AUTO TOP DRESSING
restores the faded top to its original color. A leaking top is waterproofed with one coat. It does not stiffen or harden to break when the top is folded. Anyone can apply it. Sold all over the country by Garages and Supply Dealers. Price: 1 gallon can, $3.75; ½ gallon can, $1.90; ¼ gallon can, $1.00.
THE COLUMBUS VARNISH CO.,
Columbus, Ohio.

FORD OWNERS—GET OUR CATALOG. AUTO PARTS CO., PROVIDENCE, R. I.

AUTOMOBILE WANTED
I WILL exchange Boston income property for used touring car, $500 to $3,000 value; will pay some cash if necessary. PITKIN, 209 Washington St., Suite 58, Boston, Mass.

FOR SALE—Pope-Hartford engine, 1910 model, fine condition, $125.00. BOX 211, care Motor World.

FOR SALE OR EXCHANGE, for automobile, not earlier than 1911 model, 40 ft. motorboat, 12 ft. beam, 2½ ft. draught, 6 ft. headroom cabin, sleeps four comfortably; toilet, wash basin, dory, 15 h. p. 2-cylinder Mianus motor; thoroughly equipped in every way, with full inventory; in commission; price, $800. Apply to E. SHUTTLEWORTH, 815 Vernon Ave., Long Island City, N. Y.

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FOR SALE—Locomobile, 1911 model; horsepower, 30.6; maker, Locomobile Co. In good order. Not been used this year. Cost $5,000.00. Highest offer gets it. In perfect running order. Address M. W. ADAMS, Chatham, N. J., where car can be seen,

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AGENTS WANTED — To handle the $1000 G. J. G. "Junior," racy, classy and specially designed chaseabout with 104-inch wheelbase, with a real 26 H. P. motor, Bosch magneto, Dorian remountable rims with 32 x 3½ tires, at a price of $1,000, which is a money-maker for the sales agent. Write for literature and discounts to G. J. G. MOTOR CAR COMPANY, White Plains, N. Y.

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EXECUTIVE ENGINEER AND SALESMAN desires position in either service or selling departments. Ability proven; go anywhere, either factory or branch. BOX 206, Motor World.

AUTOMOBILE AGENTS—I want local agents in every county in the United States to handle a popular-priced line of automobiles; a good name and reputation for integrity counts more with us than money or experience; if you have $300 and can furnish bond you can procure the agency for our high-grade car and we will furnish you with demonstrator. For full particulars address R. C. LEWIS, Sales Manager, Box 55, Milwaukee, Wis.

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You will be dumbfounded at the cost as indicated by the hands in the margin.



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Some automobile owners are always cleaning their spark plugs —others who use Reliance Plugs don't have to.

The Reliance book, "Ignition and Spark Plug Talk," tells why. Supposing you write today and get a copy.

JEFFERY DEWITT CO.

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Largest Exclusive Spark Plug Manufacturers in the World

Any Kind Every Kind Stock, or to Blue Print

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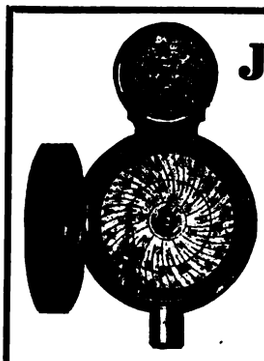
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For Automobiles, Motor Trucks, Aeroplanes, Motorcycles, Bicycles.

We Also Make Axles and Hubs.

MOTT WHEEL WORKS, Utica, N. Y.

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Gives time, speed and distance. Number of stops—length of each stop. Complete record of every movement or stop of vehicle marked on chart. Absolutely essential to all operators of motor trucks or delivery wagons.

The Jones Recorder consists of a strong brass casing, containing a clock work and flexible shaft from the drive wheel of the vehicle.

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Magneto Bargains

$30.00 for a **$105.00** 6 cylinder
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Imported U. & H. High Tension Magnetos Less Than Import Cost

Circular and Price Lists Free

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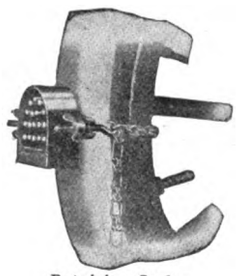
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Costs Little to Buy— Costs Nothing to Operate

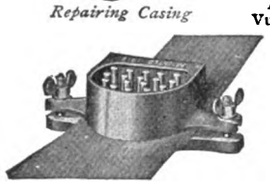
No Battery—No Wire—No Bulb—No Motor to break down or fail to work.

THE G. PIEL COMPANY 13th Street and Boulevard LONG ISLAND CITY

Philadelphia, 1416 Vine St.; Boston, 109 Massachusetts Ave.; Minneapolis, 70 So. 10th St.; Buffalo, 852 Main St.; San Francisco, 544 Van Ness Ave.; Los Angeles, 1229 So. Olive St.; Seattle, 917 E. Pike St.; Portland (Ore.), 329 Ankeny St.; Denver, 15th and Curtis Sts.



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You can repair **CASINGS** and **INNER TUBES** anywhere in 15 minutes, better than a Repair Shop can do —and for *one cent.*

Universal Auto-Vulcanizer

Patented

A practical vulcanizing outfit complete, with enough repair gum to make 40 patches. It weighs 3 pounds and can be carried in the tool box. **Simplest and most satisfactory device for eliminating tire troubles that has ever been devised.**

Absolutely automatic. Place the patch—attach the Vulcanizer—put in the gasoline light it. No further attention required. In 15 minutes the job is done.

It *can't burn, scorch* or *injure* tube or casing. It *can't* get out of order. It *can't* fail to do its work. So simple, anyone can operate it. The Universal Auto-Vulcanizer saves its cost a *hundred times* over in trouble and expense.

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Guaranteed Satisfactory or Money Refunded

ADAMSON MFG. COMPANY, East Palestine, Ohio

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should break their journey and avail themselves of the excellent facilities afforded by the D. & C. Lake Lines, operating daily service between Detroit and Buffalo and Detroit and Cleveland.

Enjay the delights of the cool breezes from Lake Erie and resume your journey in the morning after a refreshing night's rest. Special attention given by this Company to the handling of automobiles. Rates quoted on application (state wheel base); Tanks of Automobiles must be emptied of gasoline before being shipped; three gallons of gasoline supplied free on arrival at destination.

Roads in this section of the country are in first class condition; new road now under construction between Detroit and Toledo. Tourists speak highly of the route between Buffalo and New York.

On your trip this summer bear in mind "The Waterway is The Only Way."

DETROIT & CLEVELAND NAVIGATION CO.,
General Offices, Detroit.

Standard Universal Rims



fit any style or make of tires. The side rings are reversible, they curve outward on one side to fit a straight side tire, inward on the other to accommodate a clincher. Two turns of a nut unlocks the rim for demounting, two more turns locks the rim in place. Write for catalog 607, which explains fully.



THE UNITED RIM COMPANY, Akron, Ohio

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KLAXON

AUGUST 15th

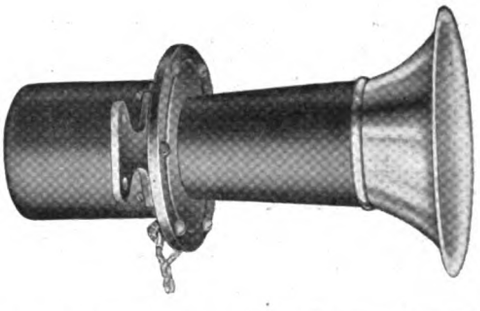
ORDERS will now be taken for the Klaxet —and filled in the order of their receipt.

Deliveries will begin two weeks from Monday—September 1st.

Dealers who are alive to the enormous demand that exists for a *motor-driven* signal at a low price will lose no time in placing their orders.

Manufacturers who are seeking an economical way to satisfactorily supplant the notoriously inadequate bulb-horn will include the Klaxet in their 1913 equipment.

And above all will the Klaxet be ordered by *motorists*. Those who have fussed and fumed with electric "buzzers," exhaust and hand-power types, and are looking for permanency and real efficiency at a moderate cost.



KLAXET

MOTOR DRIVEN $12

COMPLETE WITH WIRE AND PUSH-BUTTON

OPERATED on the same principle as the Klaxon and Klaxonet: a steel diaphragm vibrated by a motor-driven ratchet wheel. Invariably reliable—unmistakably a *danger* signal—sharp, action-compelling, irresistible.

Sold under the regular "Klaxon" guarantee.

Finished in black enamel; black enamel and brass; black enamel and nickel. All at the same price.



KLAXONET

Lovell-McConnell Mfg Company Newark, N.J., U.S.A.

KLAXON

"The Public Safety Signal"



KLAXON

KLAXONET

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Studebaker

The All Important Question of "Reputation"

All important for the dealer—important to every car buyer—when that reputation is based—as the Studebaker reputation is—on the proved integrity of the builder, the performance of the cars and the uniform satisfaction of every one of the 75,000 Studebaker car owners.

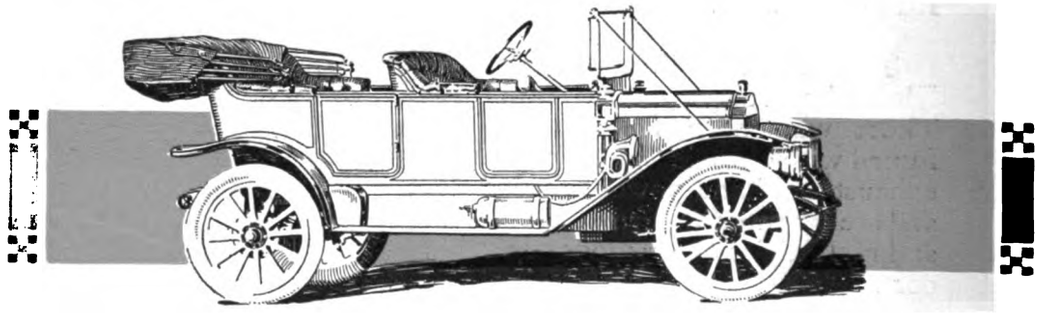
The Studebaker name has been a synonym for integrity in the vehicle industry for over 60 years—and that reputation is the proudest heritage of the Studebaker Corporation. That reputation the Studebaker car is built to uphold jealously.

The performance of Studebaker cars is absolutely unmatched. In hill-climbing and track contests their records are unbeaten—while such "path finding" achievements as that of the famous Dixie Trail or in the unopened wilderness of British Columbia have given them a reputation among motorists that is invincible. Studebaker cars have proved their quality under the most exacting conditions of service.

But it is the daily experience of the 75,000 that really counts—with the varied car ment, car service and road conditions th nation-wide ownership represents.

Uniform satisfaction among 75,000 owners every one a booster, allays any possible e ment of doubt and makes the Studebaker re tation unique.

Such a reputation eliminates every elemen chance for the dealer or the buyer. With su a reputation Studebaker cannot afford to ta a single chance.



The $800 Studebaker (Flanders) "20"

Equipped with Top, Windshield, Prest-O-Lite Tank and Speedometer, $885 f.o.b. Detroit

STUDEBAKER CARS

(Nickel or Brass Trimmed)

STUDEBAKER (FLANDERS) "20"	
Touring Car	$800
Roadster	750
Utility Car	800
Delivery Car	800

STUDEBAKER (E-M-F) "30"	
Touring Car	$
Detchable Demi-Tonneau	1
Roadster	1

See our dealer. You can get prompt delivery. Our Art Catalog A-9 is yours for the asking.

The Studebaker Corporation Detroit, Michigan

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THE MOTOR WORLD

A Trade Paper Giving the World's Motor News

Vol. XXXII
No. 9

New York, August 22, 1912

Ten cents a copy
Two dollars a year

1913 Stoddard-Dayton "48" 1913



No Other Car at the Price has the Size, Style and Luxury of the Stoddard - Dayton "48"

THE "48" has no competitor, with an established place in Motordom, at nearly its price. It is one of the models which have built the enviable reputation of Stoddard-Dayton cars—which demonstrated that it is unnecessary to pay more than $2800 for a car of real quality.

The "48" is built for comfort, beauty and serviceability—its body is roomy, its lines graceful and modern. Deep upholstery, long wheelbase and springs, powerful and quiet motor, are features to which Stoddard-Dayton "48" owners point with pride and admiration.

A car which can be produced consistently for nine years, progressing steadily as new refinements and conveniences were adopted, is the kind of car which you want to own.

The specifications and equipment of the Stoddard-Dayton "48" include: 123-inch wheelbase; 36 x 4½ tires; Q. D. demountable rims; selective transmission; gas head lights and tank; Hartford shock absorbers; powerful brakes; ignition system with starter button; mohair top and boot; storm curtains; windshield; all tools.

Deliveries Now *Dealers everywhere are prepared to make deliveries of the touring car and roadster models at once. We will be glad to send you the Advance Catalogue for 1913. Write for it.*

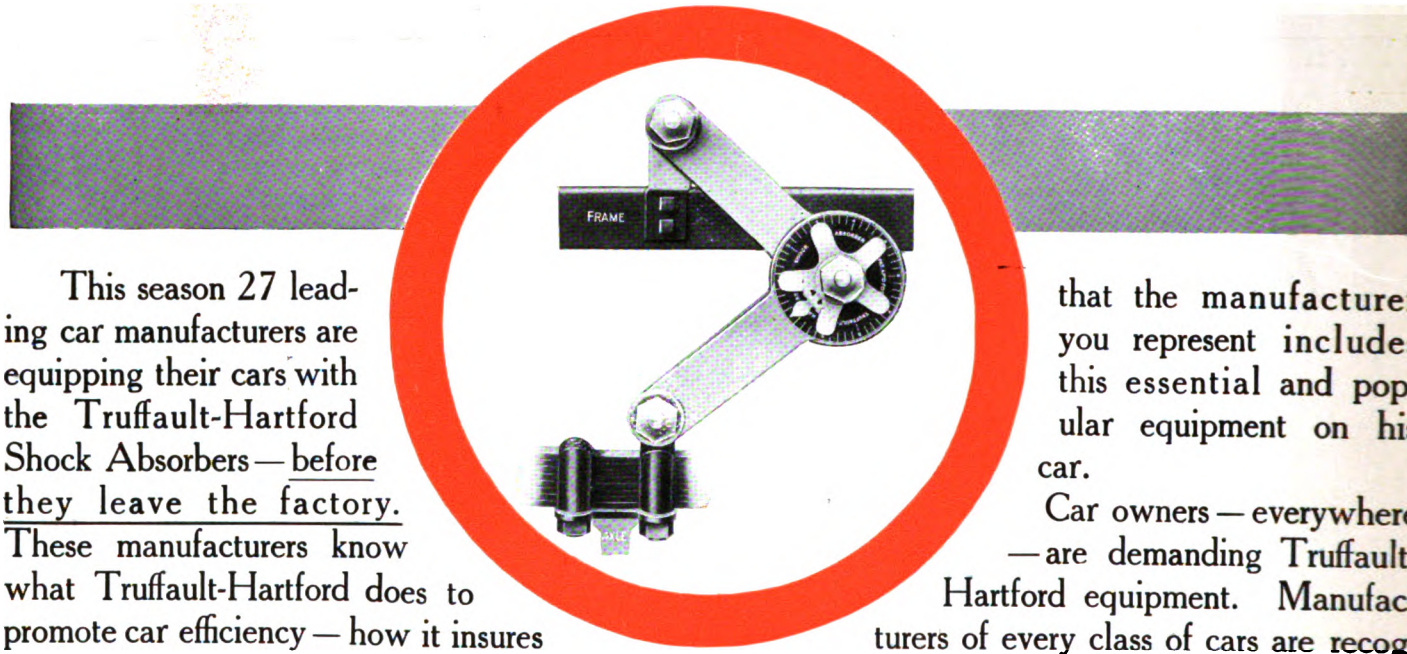
UNITED STATES MOTOR COMPANY

1 West 61st Street — *Stoddard-Dayton Division* — New York City

Published Weekly by The Motor World Publishing Company, 1600 Broadway, New York

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Does the Car You Sell Include This Necessary Equipment?



This season 27 leading car manufacturers are equipping their cars with the Truffault-Hartford Shock Absorbers—before they leave the factory. These manufacturers know what Truffault-Hartford does to promote car efficiency—how it insures maximum riding comfort—and reduces the cost of upkeep.

And for these reasons they decided the Truffault-Hartford Shock Absorber should be included as standard factory equipment on their cars.

Is the car YOU sell Truffault-Hartford equipped? You owe it to yourself to insist that the manufacture you represent include this essential and pop ular equipment on hi car.

Car owners—everywher —are demanding Truffault Hartford equipment. Manufac turers of every class of cars are recog nizing this demand—and meeting it. An YOU, as a progressive dealer susceptibl to your own interests, should see tha this equipment is furnished as a part of th car you sell.

We have a profitable and attractive propo sition for alert dealers. If interested, write u for detailed information.

Truffault-Hartford SHOCK ABSORBER

HARTFORD SUSPENSION COMPANY

164 Bay Street — **EDW. V. HARTFORD, President** — **Jersey City, N. J.**

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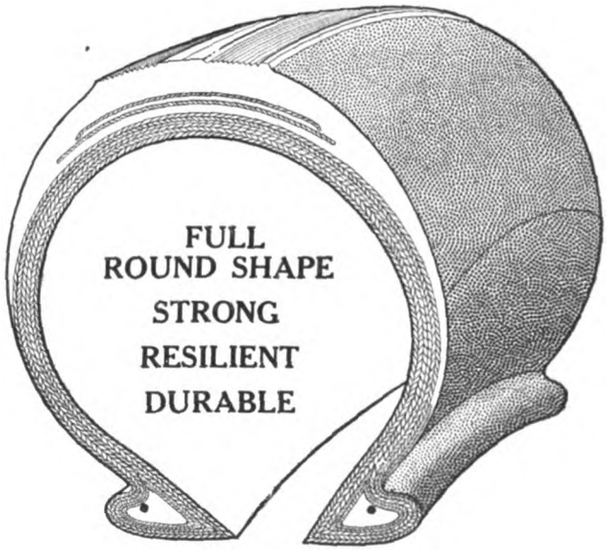
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JERSEY CITY, 143-145 Morgan St.
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Quick Detachable Clincher



¶ Extra-heavy long wearing Tread.

¶ Substantial Side Walls.

¶ Flexible Beads protect Inner Tube.

¶ No inside Envelope Flap Needed.

MICHELIN — MILLTOWN — N. J.

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Mr. Automobilist:

Your tire maker is very anxious to impress upon you the importance of

Tires Inflated to the Right Pressure

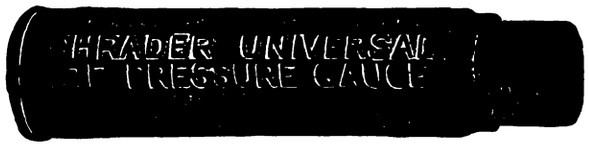
He insists that this is tire economy and

Saves You Money

How do you know what pressure you have in your tires? A

SCHRADER
UNIVERSAL
Tire Pressure Gauge

(Trade Mark Registered in U. S. Patent Office)



(Patented March, 1898—Other Patents Pending)

will tell the exact pressure in your tires at any time, day or night, by simply holding this Gauge to your Valve for a second. Its recording sleeve remains in place, showing the exact pressure in the tire so that the Gauge can be taken anywhere and read, at night to the front of the car into the light of the lamps. After the pressure has been ascertained the Indicating Sleeve can be pushed back into the Gauge with your finger. No catches or snaps to operate or get out of order. This Gauge is 2½ inches long over all, short enough to apply easily to the smallest diameter of wheel and can easily be carried in the vest pocket or the change pocket of your trousers.

Price $1.00 Each
Ready for Delivery Now

Guaranteed Simple and Absolutely Accurate

Can be obtained from all tire manufacturers and the dealers, or

A. SCHRADER'S SON, Inc.
28-32 Rose Street New York City

ADVERTISERS INDEX

A
Abbott Motor Co. 54-55
Adamson Mfg. Co. 76
Ajax-Grieb Rubber Co. 61
American Ball Bearing Co. ... 69
American Motors Co. 70
American Starter & Carburetor Mfg. Co. 68
Apple Electric Co. 66
Argo Electric Vehicle Co. 72
Atwater Kent Mfg. Works. 72
Automobile Supply Mfg. Co. .. 69

B
Badger Brass Mfg. Co. 68
Bantam Anti-Friction Co. 67
Barthel, Daly & Miller. 62
Bartholomew Co. 62
Benz Auto Import Co. 64
Bosch Magneto Co. 63
Bossert Co. 73
Bretz Co., J. S. 76
Briggs-Detroiter Co. 70
Brown-Lipe-Chapin Gear Co. . 67
Bush Mfg. Co. 71

C
Cartercar Co. 70
Chalmers Motor Co. 37
Champion Ignition Co. 66
Champion Spark Plug Co. 66
Clarke-Carter Automobile Co. 70
Classified Advertising 74-75
Cole Motor Car Co. 70
Colonial Electric Car Co. 68
Consolidated Mfg. Co. 68
Continental Motor Mfg. Co. ... 71
Covert Motor Vehicle Co. 69
Cukor Safety Crank Co. 58

D
Dayton Auto Truck Co. 68
Dayton Rubber Mfg. Co. 73
Dean Electric Co. 41
Detroit & Cleveland Navigation Co. 76
Diamond Rubber Co. 69
Double-Fabric Tire Co. 67

E
Electric Welding Products Co. 60
Empire Automobile Co. 65

F
Federal Miniature Lamp Wks. 72
Federal Rubber Mfg. Co. 59
F. I. A. T. 68
Fire Proof Garage Co. 73
Firestone Tire & Rubber Co. .. 57
Ford Motor Co. 65
Franklin Automobile Co. 62
Fulton-McCutchan Co. 71

G
G. C. A. Mfg. Co. 76
Goodyear Tire & Rubber Co., The 72
Grant-Lees Machine Co. 73
Great Northern Hotel. 64
Grossman Co., Emil. 71

H
Hartford Suspension Co., Inside front cover
Havers Motor Car Co. 44
Haynes Automobile Co. 68
Hodge & Graves. 66
Hudson Motor Car Co. 38
Hupp Motor Car Co. 69
Hyatt Roller Bearing Co. 69
Hydraulic Pressed Steel Co. .. 67

I
Ignition Starter Co. 73
Inner Shoe Tire Co. 72
Inter-State Automobile Co. 65

J
Jeffery-Dewitt Co. 76
Jencick Motor Corp. 66
Jones Speedometer 76

K
Kellom & Co., Chas. F. 72
Kelly-Springfield Tire Co. 73
Kinsey Mfg. Co. 67
Kissel Motor Car Co. 45
Kline Motor Car Corp. 70



Digitized by Google

ADVERTISERS INDEX

Knight-Davidson Co. 65
Knox Automobile Co.....50-51

L

Lauth-Juergens Motor Car Co. 63
Lee Tire & Rubber Co..... 36
Leather Tire Goods Co..... 73
Locomobile Co. 72
Lovell-McConnell Mfg. Co., Inside back cover

M

McCue Co. 49
McGraw Tire & Rubber Co... 73
M & P Electric Vehicle Co... 40
Metz Co. 72
Michelin Tire Co..... 1
Michigan Buggy Co..... 65
Miller, Chas. E..... 59
Moline Auto Co..... 61
Mosler & Co., A. R..... 73
Moss Photo Engraving Co.... 63
Motor Car Equipment Co..... 72
Mott Wheel Works..... 76
Motz Tire & Rubber Co..... 72
Mutty Co., L. J..... 72

N

National-Acme Mfg. Co..... 72
National Motor Supply Co.... 72
National Motor Vehicle Co... 65
New Departure Mfg. Co..... 73
New Process Rawhide Co..... 69
Niagara Sales Co..... 73
Nordyke & Marmon Co..... 65
Nyberg Automobile Works.... 3

O

Oakland Motor Car Co.....42-43
Otho Motor Co..... 71
Owen & Co., R. M..... 72

P

Penn Spring Works..... 73
Perfection Spring Co..... 73
Piel Co., J..... 66
Polson Mfg. Co..... 58
Premier Motor Mfg. Co.....46-47
Prest-O-Lite Co. 71
Pullman Motor Car Co..... 62

R

Rajah Auto Supply Co..... 67
R. C. H. Corp..... 65
Reliance Speedometer Co..... 71
Remy Electric Co..... 64
Republic Rubber Co..... 71
Royal Equipment Co..... 62
Rutenber Motor Co..... 70

S

Sanford Motor Truck Co..... 61
Schrader's Sons, A., Inc..... 2
Shawmut Tire Co..... 68
Sheldon Axle Co..... 48
Sparks-Withington Co. 73
Speedwell Motor Car Co..... 69
Splitdorf Electrical Co..... 66
Springfield Metal Body Co.... 72
Standard Roller Bearing Co... 72
Standard Wheel Co..... 67
Stearns Co., F. B..... 62
Stewart Motor Corporation... 62
Streator Motor Car Co..... 70
Stromberg Motor Devices Co. 53
Studebaker Corporation, Back cover

T

Timken Roller Bearing Co.... 39
Tobias, F. H..... 73
Twitchell Gauge Co..... 58

U

Underwood Typewriter Co.... 71
United Rim Co..... 76
U. S. Motors Co.....Front cover
United States Tire Co..... 71

V

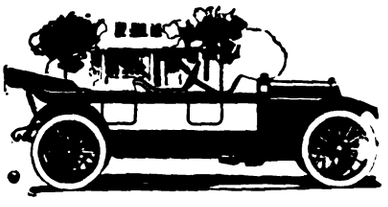
Valentine Co., J. H..... 64
Volkmar Auto Starter Co.... 66

W

Warm Hand Steering Wheel Co. 52
Warner Gear Co..... 61
Warner Instrument Co..... 63
Weed Chain Tire Grip Co..... 72
Whitney Mfg. Co..... 60
Willard Storage Battery Co... 56
Willys-Overland Co., The..... 4

Nyberg

Sixes



Have so many valuable features that an intelligent comparison of these cars with others will quickly prove the Nyberg superiority.

Nyberg Six-45 . . . $1750
Nyberg Six-60 . . . 2000
Nyberg Four-40 . . 1450
Nyberg Four-37 . . 1295

Nyberg Automobile Works
ANDERSON, INDIANA
Chicago, Ills. Chattanooga, Tenn.

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Overland 1913

$985

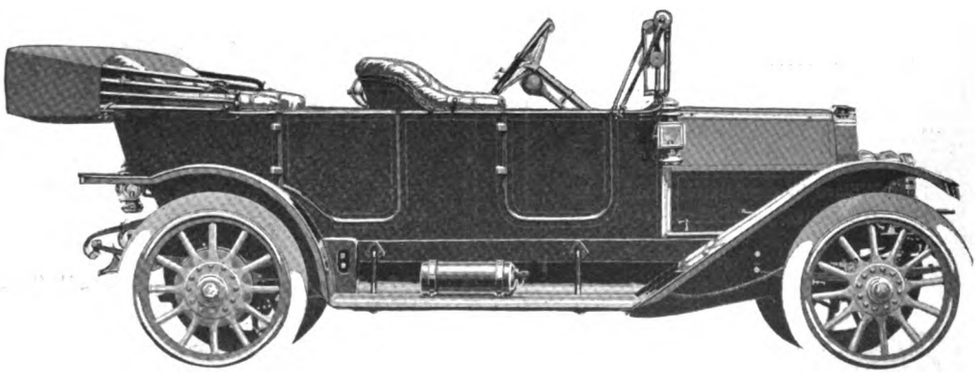
Completely Equipped

This Value is Self-Evident

Self Starter	*Remy Magneto*
30 Horsepower	*Warner Speedometer*
5-Passenger Touring Car	*Mohair Top and Boot*
110-inch Wheel Base	*Clear Vision Wind Shield*
Timken Bearings	*Prestolite Tank*
Center Control	

¶ We determined months ago that we would produce a 1913 model which would outstrip all previous efforts in the industry. We have it. The Overland Model 69T is of such a convincing value that our sales offices are deluged with orders. Since our announcement on August 17th there has been a pouring in of dealers' specifications. We could not build this car at this price were our yearly production any less than 40,000. Let us mail a 1913 catalog.

The Willys-Overland Company, Toledo, Ohio



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THE MOTOR WORLD

Vol. XXXII New York, U. S. A., Thursday, August 22, 1912 No. 9

DODGES TO MANUFACTURE A "SIX"

Car to Appear Soon, Despite Rumors of Its Abandonment—Relations with Ford Company Remain Unchanged.

Effectually disposing of rumors to the effect that the Dodge brothers of Detroit, Mich., who are large stockholders in the Ford Motor Co. and at one time built the Ford motors, had abandoned their plans of producing a car of their own, despite elaborate preparations which had been made with that end in view, John Dodge himself stated to a Motor World man on Tuesday of this week that the car itself formally would make its appearance on the market in the near future, though the exact date of its debut has not yet been set. Furthermore, the car is to be of the six-cylinder variety, and though the price at which it will sell has not yet been determined, it is likely that the new product will be placed in the moderate-priced class without any danger of straining the meaning of the words.

Despite the fact that the Dodge brothers thus are striking out for themselves, so to speak, the move, as was stated in the Motor World of May 23rd, presages no change in the relations between Dodge Bros. and the Ford Motor Co., reiteration of the denial to the effect that Dodge Bros. had disposed of its holdings in the Ford company having been made by John Dodge to the Motor World man. Further than to issue a general denial of such rumors, which he branded as being absolutely false, Dodge was not disposed to talk.

Another Payment for Grabowsky Creditors.

Bringing the total payments made to creditors up to $80,000, Lou D. Bolton, representing the creditors' committee which recently took hold of the affairs of the Grabowsky Power Wagon Co., has made payment of a second dividend of 10 per cent. on the total indebtedness of $400,000. This dividend and the previous one represent the earnings of the company under the creditors' committee. The assets remain the same.

Overholt Takes Over Reeves Engine.

The Overholt Co., of Galesburg, Ill., has purchased from the Reeves Pulley Co., of Columbus, Ind., the patterns, drawings, jigs, fixtures and parts of the air-cooled engine which up to the present time has been constructed by the Reeves company. Although the engine has been used by a number of manufacturers of light delivery cars, its principal introduction has been in the vehicles of the Aerocar Co., of Detroit, Mich.

Morgan Truck Reorganization Completed.

Completing the reorganization of the Morgan Motor Truck Co., of Worcester, Mass., the presidency of which was assumed by Charles F. Foster, the following officer and directors have been elected: Evan F. Jones, treasurer; Jerome R. George, John E. Bradley and Lancaster P. Clark, directors. The capital stock has been reduced from $1,100,000 to $300,000.

Empire Company Plans Expansion.

The Empire Automobile Co., of Indianapolis, Ind., is planning the erection of a second factory building. The expansion is by way of facilitating the production of the company's Empire "25" cars, and when the building is completed it is quite probable that one or more models will be added.

Body Making Plant for South Bend.

For the purpose of manufacturing automobile bodies and parts, the South Bend Auto Body Co. has been incorporated with $20,000 capital. Headquarters are in the Indiana city for which the company is named. The incorporators are, S. W. Nicholson, J. C. Paxon and V. E. Paxon.

To Manufacture Tire Filler in Texas.

For the purpose of making a compound to take the place of air in pneumatic tires, a company has been formed in Fort Worth, Tex. Among those who are intimately connected with the venture are N. M. Pressley and A. N. Evans.

NEW MAIS COMPANY SUCCEEDS OLD

Wheeler, Carburetter Maker, Acquires Controlling Interest in New Company and is Made President—Brown to Stay.

As was to be expected, the sale of the Mais Motor Truck Co. of Indianapolis, Ind., which took place on Monday, 19th inst., following the appointment of a receiver on July 8th last, brought out but one bid, and though that bid represented the interests of several stockholders, at least one of the names that hereafter will be prominently associated with the company is a brand new one to the commercial vehicle industry, though it is one that is by no means new to the trade. Frank H. Wheeler was the moving spirit behind the negotiations which resulted in the purchase of the plant by himself and Walter M. Pearce and H. G. Francis, both of Huntingburg, and both stockholders in the company.

Immediately succeeding the purchase of the plant, which was sold at public auction for $71,000, Wheeler proceeded to form a new company of the same name, and with $1,000,000 capital stock, of which Wheeler himself controls 50 per cent. Wheeler has been made president of the new company, with Pearce as vice-president and Alvin S. Lockard, another stockholder in the old company, as secretary and treasurer. These men, together with J. V. Stimson, of Huntingburg, and H. G. Francis form the board of directors. Although Will H. Brown, who was president of the old company, is said to have no stock in the new company, it is not unlikely that he will be appointed to the general managership.

The sale of the plant was formally approved by Judge Collier of the Superior Court of Marion County on Tuesday last and, according to the terms of settlement, the purchasers are required to pay one-third of the sale price in cash, one-third in 12 months and the balance in 18 months. In addition to acquiring the plant and its equipment, the purchasers also take over

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approximately $12,000 in accounts receivable and $10,000 in notes receivable. The plant with its equipment and raw materials and parts was appraised at $180,959.92, and inasmuch as the liabilities at the time the receiver was appointed were set down as $250,000, it is understood that creditors are fairly well satisfied with the settlement that has been made, which represents practically 30 cents on the dollar. The purchasers assumed a mortgage of $10,000 on the property.

Since the appointment of the receiver in July, the plant has been continued in operation, and according to tentative plans which have been drawn up, and which likely will be followed closely, manufacture not only will be continued, but a material increase in production will be made in the very near future. Inasmuch as the truck which has been produced in the past has proven entirely satisfactory and has built up a name for itself, it is not planned to make any radical changes in its design or construction, but to continue it in substantially its present form.

Kayton Petitioned into Bankruptcy.

Simon Kayton of 134 East 95th street, New York City, has followed into bankruptcy the Kayton Taxicar and Garage Co., of which he was president and against which a petition was filed July 29; his liabilities are $7,650 and assets consist of 160 or 165 shares of stock in the bankrupt company. The shares are of unknown value. The creditors of the taxicab company met Tuesday of this week, 20th inst., and chose Robert P. Lewis trustee, with a bond of $10,000. It is expected that $15,000 will be realized from the sale of the assets; the liabilities are $30,304.

Universal Truck Asks Payment of Note.

The sale of a Universal truck to Feuer & Co., operators of an express company at 10 Hudson street, Yonkers, N. Y., is responsible for an action instituted this week in the Supreme Court for New York county by the Universal Truck Co. of New York against Mollie Feuer. The complaint asks the recovery of $400, the face of a note given in April, when the truck was sold. Peter Feuer, the defendant's husband, has been active in the business, but the action is directed against his wife in the belief that she is the major owner in the establishment.

Schacht Adds Worm-Driven Truck.

Having felt out the field with the aid of a demonstrator, which has been in service for upwards of two years, the Schacht Motor Car Co., of Cincinnati, O., has added to its line of pleasure cars a new one-ton commercial vehicle which shortly will be placed on the market. The truck will be standard in construction throughout and will employ worm drive to the rear axle. Another of its distinctive features will be that it is to be equipped with pneumatic tires in front and solid tires in the rear.

BRANCHES NOT TO BE ABANDONED

Sale of Two United States Motor Agencies Not Part of a General Plan—Disposes of Small Ones Only.

Although the sale of the United States Motor Co.'s Buffalo branch last week lent color to the stories which have become current, to the effect that the parent company was perfecting plans to get out of the retail end of the business, and the color was deepened by the subsequent sale of the Albany branch and the general knowledge of the fact that negotiations were pending for a similar arrangement in Indianapolis, it is denied by officials of the U. S. Motor Co. that there is any intention to drop the retail business, or at least to drop it entirely. The Albany branch has been disposed of to the W. M. Whitney Co., which acts as a distributer for Fiat and Mercer cars, and it will be continued by the Whitney company as a wholesale distributing center for the products of the U. S. Motor Co., the arrangement being similar to that which obtains in Buffalo, where branch Manager Munroe last week purchased outright the agency.

According to officials of the parent company, only factory branches in the smaller cities will be disposed of, and wherever possible will be sold to the agency or company which in the past has handled the U. S. Motor products. In the larger cities, however, factory branches will be maintained and, as heretofore, will act as both wholesale and retail distributing centers. The negotiations which have been pending in Indianapolis have not yet been brought to a head, but it is planned to make the arrangement in that city similar to those which just have been completed in Buffalo and Albany.

Rumely Shops Visited by Fire.

The Laporte, Ind., shops of the Rumely Oil Pull Tractor Engine Co. were visited by a devastating fire on Wednesday last, 14th inst., which resulted in a loss of $25,000. The fire started in the paint shop, supposedly from spontaneous combustion, and although there were some thirty men at work in the building at the time, all escaped. Owing to the fact that the main buildings are fireproof, they were only slightly damaged, though some thirty-eight of the company's oil-pull tractors were partially burned. It is said that the fire was the most disastrous which has occurred in Laporte in 20 years. A new building will be put up immediately.

Disco Makers Reorganize and Expand.

By way of permitting of greatly increased activities which, as announced two weeks ago in the Motor World, will include the production of an electric engine starting, ignition and lighting system, the Ignition Starter Co., of Detroit, Mich., has been reorganized and its capital has been increased to $500,000. J. Watson Fitzgerald has been made president and associated with him are H. H. Sanger, of the National Bank of Commerce, of Detroit, as vice-president, A. B. Porter, who is treasurer, and George B. Sweet, who is secretary. The big plant on the corner of Leib and Larned streets, formerly occupied by the Gray Motor Co., has been leased and will be used for the manufacture of the new Disco starting and lighting system.

Bergdoll and Westinghouse Settle Trouble.

The litigation between the Westinghouse Machine Co., of Pittsburgh, Pa., and the Louis J. Bergdoll Motor Co., of Philadelphia, over alleged breach of contract has been amicably settled, satisfaction for the $104,000 judgment, which was obtained against the Bergdoll company, having been entered on Thursday last, 15th inst., on the records of the Court of Common Pleas No. 4, in Philadelphia, Pa. The trouble originally grew out of a contract which the Bergdoll company had with the Westinghouse company, whereby the latter agreed to build for the Bergdoll company 1,000 motors to be delivered at a rate of not less than 100 a month. After some 600 of the motors were delivered to the Bergdoll company it declined to receive or pay for the balance, alleging that the Westinghouse company had failed to make deliveries as agreed, the concrete result being a considerable loss in sales of automobiles, the construction of which depended upon the delivery of the motors. The court decided that there had been no breach of contract on the part of the Westinghouse company and so awarded it a judgment for $104,000. By the terms of the settlement which has been made, the balance of the motors are to be shipped to the Bergdoll company as its needs require.

Flanders Finally Out of Studebaker.

Having composed all his differences with the Studebaker Corporation, of which he was vice-president and general manager, Walter E. Flanders finally has washed his hands of that company, so to speak, and henceforth is free to devote his time and his energies and principally his name to whatever ventures he may see fit. The settlement was perfected last week, following negotiations which have extended over a considerable period of time. Immediately after the release was successfully negotiated, Flanders became general manager of the Everitt Motor Car Co., the name of which immediately was changed to Flanders Motor Co., and its destinies otherwise altered so as to permit of the manufacture of six-cylinder cars exclusively. Two models will be made, the one being a full-sized creation selling at a moderate price with full equipment, and the other a "little six," which likewise will be sold fully equipped and at a figure which will place it even more surely in the moderate price class.

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STIR IN INTERNATIONAL AFFAIRS

Combines, New Factories and Removals Linked in Rumors Affecting Corporation—Developments Near.

Rumors which for some little time persistently have connected the International Motor Co. of New York City and the General Vehicle Co. last week were stirred up afresh when R. McA. Lloyd, who for several years has been vice-president and general manager of the General Vehicle Co., resigned that position to become assistant to the president of the International company, thereby seemingly lending color to the story that these two companies really intended coming together after all. That there is no possibility of their ever joining hands, however, is affirmed by President Wagoner of the General Vehicle Co. President Copeland of the International company, though neither affirming nor denying the story, has given out that within the next ten days, at least, startling developments may be looked for. Just what their nature may be he did not divulge.

Even though the International company does add electric vehicles to its line, however, and it is altogether likely it will do so before very many moons, it is certain that rumors which have linked its name with that of the Lansden Co. of Newark, N. J., are without foundation, as are those which would have it that the company likely will remove to Chicago in the near future. W. L. Case, who is general manager of the Lansden company, states that the establishment of a plant in Chicago never has been considered, and that the company expects to occupy its present site in Newark, where it just has settled down, for a number of years. It has been rumored, also, that John M. Lansden might return to his first love, though this story, too, is denied by Case, who points out that Lansden is not known by any of those now at the head of the Lansden company and that it is extremely unlikely that circumstances will arise which will call for his having anything whatever to do with Lansden affairs in the future.

Another of the rumors which on several occasions has cropped up connects the recently organized Atlantic Vehicle Co. of New York City with the International company, and though it is said that the International company at one time had entered into negotiations with a view to taking over the Atlantic company, President Sanger has denied that there is any possibility of this ever coming to pass.

Hitch Develops in Cadillac Expansion.

Although a few weeks ago, when negotiations were commenced for a material increase in the size of the plant of the Cadillac Motor Car Co., of Detroit, Mich., all appeared plain sailing, a hitch has developed which already has caused trouble between the Cadillac company and the civic authorities and which may result in the abandonment of the plan to increase the size of the Detroit shops in favor of a location in another city. By way of facilitating building and shipping operations, it was practically arranged that Cass avenue should be closed from Amsterdam street to Baltimore avenue, a distance of two ordinary blocks. Now, however, the common council denies the petition to close the street, the result being that the Cadillac company has threatened to construct its new plant in some other city unless the street is closed. A public meeting has been called for to-day (Thursday) in order to give business men and the people generally a chance to express their opinions.

Three-Wheelers Coming from Middletown.

For the purpose of manufacturing a new three-wheeled commercial vehicle, the Industrial Motor Car Co. has been formed with $350,000 capital stock. The officers are as follows: William G. Richardson, president; Waite M. Cotton, vice-president; Robert M. Bagg, secretary and treasurer. Headquarters have been established in Middletown, N. Y., where the factory formerly occupied by the National Saw Co., which since has removed to Newark, N. J., has been acquired. Alterations in the eighteen buildings which eventually will be occupied already are in progress, and immediately they are completed the company will commence the manufacture of its cars in earnest. The vehicle which will be produced is styled "Minute Man Tri-Car" and is equipped with a two-cylinder, 16-horsepower opposed motor, two-speed planetary change gear and bodies which will be optional according to the requirements of the purchaser. The wheelbase is 86 inches and the price of the cars, fully equipped, is $485.

Hartford Establishes Asbury Park Branch.

The Hartford Suspension Co., of Jersey City, N. J., among whose better known products are Truffault-Hartford shock absorbers, has established a seaside branch at Asbury Park. In addition to acting as a distributing center, it will be maintained as a complete service station. It is located at Ocean and Third avenues.

Reo Distributes Another Dividend.

The Reo Motor Car Co., of Lansing, Mich., has announced another distribution of profits, making the third this year, on its $2,000,000 capitalization. The dividend is of 10.9 per cent., which represents some $200,000, and will be distributed to the stockholders in the near future.

Studebaker Declares Quarterly Dividend.

The Studebaker Corporation, of Detroit, has declared its regular quarterly dividend of 1¼ per cent. on its preferred stock. The dividend is payable Sept. 3rd and applies to the stock of record on Aug. 15th.

PRICE OF "GAS" AROUSES GARAGES

Indignation Meeting of New York City Dealers Called to Discuss Question—Prophesy 30-cent Fuel.

The soaring price of gasolene as purveyed by the oil producing companies, which commodity has climbed from 9 to 16 cents a gallon at the rate of about a cent a month for the past six months, has made itself felt to such an extent that, instead of the scattered rumbling of discontent among the garage men, there is now to be concerted action, at least so far as New York City is concerned; the call has been issued for a dinner and meeting to be held September 10 at Reisenweber's Hotel, 987 Eighth avenue, where men in the various branches of the automobile trade—car, tire, etc.—will discuss the matter and some definite action probably will be taken.

Charles Howard Potter, manager of the Uptown Garage at 154-60 West 124th street, has assumed the leadership, and co-operating with him are representatives of the Knickerbocker, Plaza, Apthorp and Hilltop garages, all Harlem concerns; but this does not confine the meeting to Harlem tradesmen, for representatives from the whole city are invited. Plans are yet in the making, and the list of speakers has not been formulated; just what will come of the meeting the garage men are not prepared to say, and sentiment seems to be that it is in the nature of a "feeler" to ascertain sentiment and its strength.

The garage men point out that, whereas they made a comfortable profit on gasolene before the raises came and thereby were enabled to offer a storage rate which afforded small profit, the wholesale price of gasolene now permits of profits that are too small, for the public will not put up with raises proportionate to those made by the oil companies, and since the old small-profit storage rates still obtain, they are in a fair way to lose money. Gasolene now is 16 cents to the garage man, and the reliable garages dispense it, as a general rule, at about 22 cents. The proprietors also claim that small garages and stations outside New York City are selling "gas" at 15 and 18 cents, and they charge that a lesser wholesale rate must prevail outside New York, the retail measure must be "short" or the "gas" must be diluted with kerosene—a combination which will work fairly well in warm weather in many cars.

The meeting may result in the reorganization of the old garagemen's association, which started out promisingly a couple of years ago but which went on the rocks through unskilled management. The garage operators are now banded in about five social organizations in the Bronx, East side, downtown, West side and Harlem sections, but there is no strong organization.

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RUBLY APPEALS IN 35% LAWSUIT

Grease Gun Maker Seeks Reversed Judgment and $46,000 Counterclaim—Lower Court Denies Motion for an Inquiry.

William Rubly of Tuckahoe, N. Y., manufacturer of grease guns, who recently renewed his fight against the 35% Automobile Supply Co. of New York City, after that concern secured a judgment for $2,383.30 for alleged breach of one of the plaintiff's widely known advertising contracts, has gone into the battle with an energy which indicates that the 35% concern is going to have trouble collecting the judgment; at least, if things move the way they are at present, some time will have elapsed before Rubly admits he is beaten.

His latest move was executed late last week, when his attorney, Holmes Jones, who was chosen to succeed the first Rubly attorney, appealed from a ruling of a Supreme Court judge for New York county and is to argue the merits of the point in question before the Appellate Division in October; meantime he was granted a stay of proceedings pending the appeal. If victorious in the appeal, it would be an overwhelming victory for Rubly, for he asked not only that the 35%'s comparatively small claim be dismissed, but that he be awarded damages of $46,000.

The story of how Rubly signed a contract agreeing to supply a certain number of grease guns in exchange for advertising in a circular gotten out by the 35% company, of how he finally decided false representations had been used in getting him to sign up, of how he refused to deliver any more grease guns, of how judgment was taken by default while, as he claims, he was in the West at the funeral of a relative and of how the default was opened with an amended answer, is an old tale. The present litigation hinges around the Rubly counterclaim of $46,000 in the amended answer. He claims that after the serving of the answer the defendants moved to put the cause on the day calendar and several days later submitted an answer to the counterclaims. Rubly's attorney maintained that the answer should have been submitted previously to the motion to place the cause on the calendar and, holding that the counterclaims were unanswered, accordingly moved for an inquiry to ascertain what damages he was entitled to on the "unanswered" counterclaims.

The court denied the motion for an inquiry, and it is this ruling from which an appeal is being taken. Otherwise the cause is due for argument in the Supreme Court in October.

Chevrolet Cars To Be Made in Flint.

Although it has been definitely decided that W. C. Durant's Chevrolet Motor Car Co., which at present is located on the Western Boulevard, in Detroit, Mich., eventually will be removed to occupy the buildings of the Imperial Wheel Co., which Durant last week acquired, and which are located in Flint, Mich., where Durant's other companies, the Little Motor Car Co. and the Mason Motor Co. are located, rumors to the effect that these three companies ultimately would be housed under one roof, or under one series of roofs close together, have not a perfectly firm foundation. It is true that the Chevrolet company will be removed to Flint in the very near future, which may influence the abandonment of the erection of the proposed plant on Woodward avenue, in Detroit, though, according to Durant himself, it is not likely that the three companies over which he presides will be located on adjacent plots of ground. At present, the Mason Motor Co. occupies a portion of the plant in which Little cars are produced, and in order to permit of needed expansion negotiations now are pending with the view to acquiring the old Buick No. 2 plant, which is directly across the street.

Reincorporates and "Goes Into" Rims.

To provide working capital for an increasing business, the Newmastic Tire Co., which for some time has produced Newmastic tire filler at Broadway and West 68th street, New York City, has incorporated as the Newmastic Co. and at the same stroke has substituted a capitalization of $250,000 for one of $150,000. With the change in name goes an additional line of business, for the company now plans to manufacture and market a demountable and quick detachable rim adapted especially for use with "filled" tires, the feature of which is that it locks up more closely at the bottom and is claimed to increase the resiliency of the tire. The personnel of the company remains the same, and includes Orrel A. Parker, Robert Weld and Oliver H. Bartine.

More Trouble for Atlas Engine Company.

Adding to the troubles of the Atlas Engine Works, of Indianapolis, Ind., the Minnehaha National Bank, of Sioux Falls, North Dakota, has brought suit in the Circuit Court against the company, Hugh Hanna, its president, and the United States Fidelity and Guaranty Co. to collect a judgment of $2,697. It is charged that the bank obtained the judgment against the Atlas company and that the case was appealed to the Appellate Court, which upheld the decision of the lower court of April 18th last.

Goodyear Removes its Washington Branch.

Having outgrown its former quarters, the factory branch of the Goodyear Tire & Rubber Co., of Akron, O., in Washington, D. C., has been removed to a new location. It is now located at 1016 14th street, N. W., where a more adequate stock of tires and supplies can be carried and the meaning of the word service can be more fully realized.

TO TREBLE PRODUCTION FACILITIES

Maker of Jones Instruments Leases Bush Terminal Site for Offices and Shipping —New Rochelle Plant Continued.

By way of bettering its shipping facilities and to make provision for the increased demand for its products, the Jones Speedometer of New Rochelle, N. Y., which produces Jones speedometers, mileage recorders and commercial vehicle hub odometers, has leased a floor in the Bush Terminal buildings in Brooklyn, N. Y., and it will be equipped immediately with improved machinery which will permit of the output of the company being trebled. Although the new plant will be considerably larger than the present main factory, which is located at New Rochelle, it will be operated in addition to the latter.

In carrying out the plan of expansion, the executive offices of the company and the shipping department both will be removed from New Rochelle to the Bush Terminal plant, where, by reason of the better shipping facilities, permitting shipments to be loaded directly on through cars at the factory door, it is expected that on shipments to Western points a saving of from four to eight days in time can be effected. The removal will be made on October 1st, at which time the new plant will be ready for occupancy. At the same time, the commercial vehicle instrument shipping department, which at present is located on Canal Place, New York City, where the mileage recorders, hub odometers and truck speedometers are manufactured, will be moved to and consolidated with the service station which is maintained on Broadway, at 76th street, New York City.

American-Marion Sales Company Formed.

Although J. I. Handley, who controls the destinies of both the American and Marion motor car companies, of Indianapolis, has shown no disposition to merge these companies as yet, the formation of the A. & M. Sales & Service Co., which is capitalized at $2,000 and which will market both the American and Marion cars in Indiana, Eastern Ohio, Southeastern Illinois and Western Kentucky, indicates his purpose of closely allying the sales of these two cars. Handley is president of the new company, and associated with him are Thomas L. Marshall, who has been identified with him in the manufacturing companies and who is vice-president and general manager, and L. R. Wilbur, secretary and treasurer.

Josephs Sails to Foreign Shores.

Carrying with him a report of the doings of the Fiat Automobile Co., of Poughkeepsie, N. Y., J. S. Josephs sailed on Monday, 19th inst., to Europe to foregather with the directors of the parent Fiat company in Italy. He will be away several weeks.

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THE WEEK'S INCORPORATIONS




Tacoma, Wash.—Union Motor Co., under Washington laws, with $10,000 capital; to deal in motor cars.

Coldwater, Mich.—Broncher & Coffman Auto Co., under Michigan laws, with $2,000 capital; to deal in motor cars.

New Castle, Pa.—Lawrence Automobile Co., under Pennsylvania laws, with $40,000 capital; to deal in motor cars.

Burlington, Ia.—Shaagren-Hunt Co., under Iowa laws, with $25,000 capital; to deal in motor cars. Corporators—W. B. Hunt and others.

Dallas, Tex.—Marrs-Lingo Motor Co., under Texas laws, with $7,500 capital; to deal in motor cars. Corporators—A. A. Marrs, D. C. Lingo and others.

Seattle, Wash.—Mercury Motor Car Co., under Washington laws, with $5,000 capital; to deal in motor cars. Corporators—F. M. Guion, J. R. Lawson and others.

Portland, Me.—Auto Air Rotar Co., under Maine laws, with $15,000 capital; to manufacture motor car devices. Corporators—James E. Mantor, Albert F. Jones.

Frankfort, Ky.—Commercial Auto Co., under Kentucky laws, with $1,500 capital; to deal in motor cars. Corporators—J. N. Gibbons, W. R. Williams, E. N. Williams.

Chicago, Ill.—Columbus Monument Garage, under Illinois laws, with $2,500 capital; to operate a garage. Corporators—J. T. Crotty, Frank C. Taylor, J. J. Polton.

Dallas, Tex.—Republic Rubber Co. of Dallas, under Texas laws, with $10,000 capital; to deal in tires. Corporators—John P. Kelly, R. M. Randall, W. H. Siegried.

Chicago, Ill.—Automobile Supply Co., under Illinois laws, with $10,000 capital; to deal in motor car supplies. Corporators—Albert Norwald, Samuel Rubinsky and others.

Chicago, Ill.—E. C. Kadow & Co., under Illinois laws, with $25,000 capital; to manufacture motor vehicles. Corporators—Benjamin Gordon, Simon LaGrou and others.

St. Joseph, Mo.—Northwest Auto Co., under Missouri laws, with $5,000 capital; to deal in motor cars. Corporators—Benjamin F. Ellington, Claude C. Tanner and others.

Troy, N. Y.—Pioneer Motor Car Co., under New York laws, with $10,000 capital; to deal in motor cars. Corporators—Henry J. Richardson, Northrop R. Holmes, George N. Nay.

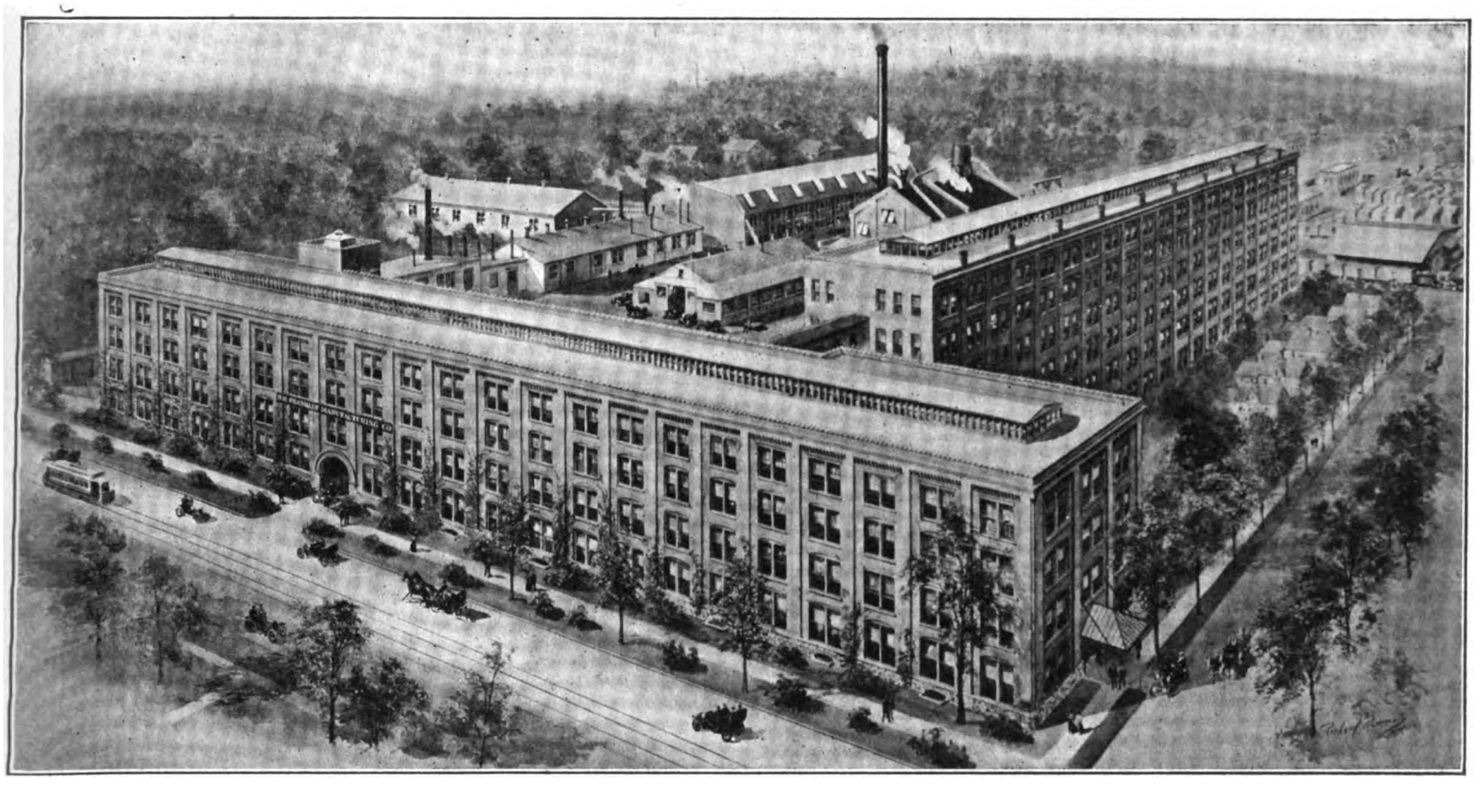
Oconto Falls, Wis.—Oconto Falls Motor Car Co., under Wisconsin laws, with $5,000 capital; to deal in motor cars. Corporators—J. H. Delbridge, W. J. Munsett, C. W. Carlson.

St. Louis, Mo.—Swap-Beynon Automobile Repair Co., under Missouri laws, with $2,100 capital; to repair motor cars. Corporators—T. W. Swap, Charles A. Madill, Albert Beynon.

Chehalis, Wash.—Twin City Automobile Co., under Washington laws, with $25,000 capital; to deal in motor cars. Corporators—A. C. St. John, Frank L. Liscomb and others.

Chicago, Ill.—M. R. L. Tire Co., under Illinois laws, with $100,000 capital; to man-

BIRD'S-EYE VIEW OF THE BUILDINGS OF THE H. H. FRANKLIN MFG. CO. IN SYRACUSE, N. Y.



From a small beginning almost so small as to be insignificant, the plant in a comparatively few years has been increased in size until it has reached its present proportions. It is devoted exclusively to the production of air-cooled cars.

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ufacture motor car tires. Corporators—Mitchell R. Labbee, Martin C. Lundholm, B. Wilson Moore.

Oakland, Cal.—Uneeda Tire & Supply Co., under California laws, with $25,000 capital; to deal in motor car supplies. Corporators—Hugh M. Webster, Walker D. Cole, George H. Kidd.

Des Moines, Ia.—Des Moines Garage & Mfg. Co., under Iowa laws, with $25,000 capital; to operate a garage and machine shop. Corporators—G. F. Knorr, John Kleinlein, F. J. Knorr, August Kahn.

Columbus, Ohio—Southern Taxicab Co., under Ohio laws, with $10,000 capital; to operate a taxicab service. Corporators—James J. Keating, James A. Allen, Thomas Decker, Jack S. Williams, A. P. Carmichael.

Pomeroy, Ohio—Pomeroy Auto and Garage Co., under Ohio laws, with $2,500 capital; to deal in motor cars and operate a garage. Corporators—A. R. Clifton, M. L. Davis, W. T. Dorst, W. N. Davis, P. L. Clifton.

Mount Vernon, N. Y.—West Side Auto Exchange, Inc., under New York laws, with $1,500 capital; to deal in motor cars. Corporators—James S. Haslett, Ernest Jones, Charlotte E. Haslett, all of 341 North High street.

New York, N. Y.—Blitzen Co., under New York laws, with $1,000 capital; to deal in motor car specialties. Corporators—William G. Decker, 33 Wall street; James B. Mackie, Fred B. Scofield, both of 15 Wall street.

Brooklyn, N. Y.—Revilo Auto Co., under New York laws, with $5,000 capital; to deal in motor cars. Corporators—Philip Roth, 3396 Fulton street; Donato Cella, 2959 Atlantic avenue; Frank Dunn, 3009 Atlantic avenue.

Cleveland, Ohio—Mutual Oil & Auto Supply Co., under Ohio laws, with $10,000 capital; to deal in oils, greases and motor car supplies. Corporators—E. L. Steuer, H. C. Killiman, Herbert Haase, C. F. Franke, A. S. Kraus.

Brooklyn, N. Y.—Generator Valve Co., under New York laws, with $2,000 capital; to manufacture motor car accessories. Corporators—Harry James, John James, both of 1090 Bedford avenue; S. Henry Holland, 7516 15th avenue.

New York, N. Y.—Pope Motor Car Co., under New York laws, with $100,000 capital; to deal in motor cars. Corporators—Francis E. Walbridge, 12 Broadway; Gilbert M. Stratton, Chester M. Stratton, both of 906 Union street, Brooklyn.

New York, N. Y.—Hurlburt Motor Truck Co., under New York laws, with $150,000 capital; to manufacture motor trucks. Corporators—Joseph P. Carroll, 897 East 167th street, New York; William B. Carswell, 121 St. Marks avenue, Brooklyn; F. D. Peale, 212 Summit avenue, Summit, N. J.

OLD PROPRIETOR NOW TENANT ONLY

Mears, Brooklyn Garage Owner, Loses Plant in Mortgage Foreclosure—Troubles Long in Accumulating.

After so many years in the garage business at 7 Ocean Parkway, Brooklyn, N. Y., that he had become almost a landmark, John W. Mears, who did business under the style Mears Auto Co., finally has been deprived of his plant through a mortgage foreclosure, and although a gallant fight was made in the face of financial reverses, he now is but the tenant of Frank B. Neefus; the deal, which was of years' duration, involved the old Acme Motor Car Co., of Reading, Pa., the S. G. V. Co., which succeeded the Acme company, and the Martin-Evans Co., a Brooklyn supply house, and also caused three lawsuits in the New York City Court, the whole finally terminating in the sale of the property at public auction late last week.

Mears secured some money from Neefus, who formerly lived in Brooklyn, when he started in business, and on April 16, 1910, contracted to sell Neefus 20 shares of the Mears company stock at $100 per share, the stock to draw 6 per cent. dividends or to be bought back at the end of two years with interest at 6 per cent. in case the dividends were not paid. This was the basis of one of the lawsuits, and Neefus secured judgment for $2,289.33, claiming he never received dividends and that the stock was not bought back.

Another action was by J. H. Sternbergh, president of the old Acme company, who took over a chattel mortgage on Mears's plant, given to cover a series of notes aggregating $4,471.95, the amount of an accumulated bill with the Acme company. The amount alleged in the action as unpaid was $1,071.95 and the amount of a judgment secured was $1,199.79. The default was in the payment of the eighteenth note of a series of twenty-two. The Martin-Evans Co.'s action was to recover for goods sold and delivered and the judgment was for $366.98.

The court ordered the property sold under the mortgage and, to protect himself, Neefus, who already had considerable money in the Mears business, bought up the other judgments and bid in the property. He then made a proposition to Mears whereby the latter continues to manage the business, but only as a tenant, paying rent in the establishment of which he was so long proprietor. Mears at one time had the S. G. V. agency, but discontinued selling these cars several months ago.

General Vehicle Sues on Note.

Alleging non-payment of a promissory demand note for $3,265.74, the General Vehicle Co., of Schenectady, N. Y., has instituted suit in the Supreme Court for New York County against White's Express Co., of Park avenue and Raymond street, Brooklyn. The note was given March 14 last, and the alleged unsuccessful demand for payment was made but recently.

Healey Forms New Pacific Coast Company.

W. J. Healey, who for several years has been secretary-treasurer and manager for the Pacific Motor Car Co., of Spokane, Wash., which has the Western distribution of Rauch & Lang electrics, Stevens-Duryea, Peerless and Hudson gasolene cars, has resigned that position and withdrawn from the company to form another which is styled the W. J. Healey Co. Healey has taken with him the agency for the Rauch & Lang electrics and has established temporary headquarters in the garage of the Cole-Spokane Co., at 1023 Third avenue. The Pacific Motor Car Co. retains the agency for the three gasolene cars.

Two More Little Agencies Added.

Additional links in the chain of agencies which W. C. Durant is establishing for the marketing of his Little cars were forged last week when a firm, known as McDonough & Cogan, and composed of Edward F. McDonough and F. T. Cogan, of Newark, was formed to distribute the Little cars in New Jersey. A sales and service station has been established at 383 Halsey street, Newark. J. W. Ward Co. is another New Jersey agent which has been appointed local distributer for the Little Motor Car Co., its territory embracing northern New Jersey. The Ward company's establishment is in South Orange.

Page Company Elects New Officers.

At the annual meeting of the stockholders of Carl H. Page & Co., of New York City, metropolitan agents for the products of the Chalmers Motor Co., of Detroit, Mich., George H. Stowe became a stockholder and in addition was elected to the vice-presidency and placed in charge of sales. Carl H. Page retains the presidency, as a matter of course. John Lorentz was elected treasurer in place of R. H. Montgomery, who has retired. Harry Bennett Leary, who is counsel for the company, was re-elected to the secretaryship.

Hess-Bright Moves to Larger Quarters.

The Hess-Bright Mfg. Co., formerly of 21st street and Fairmount avenue, Philadelphia, Pa., has removed bag and baggage and taken up new quarters on the Southeast corner of Front street and Erie avenue, in the same city. The new location affords considerably greater floor space.

Milwaukee Dealer Takes Own Life.

Charles G. Habhegger, who was intimately connected with the Theodore Habhegger Automobile & Carriage Co., of Milwaukee, Wis., which handled Firestone tires and a number of other well-known products, committed suicide last week. No reason is ascribed for the act.

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C. Jones plans to open a garage in Pekin, Ill.

Charles Thornton has opened a garage in Altoona, Ia.

William Leay has entered the garage field in Rockford, Ill.

Robert Trotter is having a garage built in Coal City, Ill.

John Wintyen is about to open a garage in Doylestown, Pa.

H. C. Dies is building a two-story brick garage in Clinton, Ind.

Charles Jones has opened a garage at 202 Court street, Peoria, Ill.

Under the style Graves Bros. a garage has been established in Melvin, Ia.

Lehighton, Pa., is soon to have a new garage; Russel Jones will operate it.

Flook & Kroth are about to build a garage, 50 x 199 feet, in Paw Paw, Mich.

William Benzie and Carl Trask plan to establish a garage in Elk River, Minn.

Henry Levy has opened a garage on the South Country road, east of East Islip, N.Y.

Harry C. Graves, of Alhambra, Cal., has secured plans for a garage and machine shop.

Esle Larson and O. A. Loberg have bought out the Peterson Garage in Cokato, Minn.

The J. P. Auto Co., of Charter Oak, Ia., has leased its repair shop to Eugene Weber.

F. H. Scharfenberg of Mazeppa, Minn., has bought the garage business of John Grossbach.

Elmon J. Craine and G. S. Lines have purchased the Strasburg Garage in Brown Valley, Minn.

The Grand Rapids Taxicab Co. has opened for business in that Michigan city; it has six cabs.

Charles E. Dickinson of Sacramento, Cal., has bought the Maxwell Garage; it is located on L street.

B. O. Caswell of Cleveland, O., has secured plans for a garage; he will erect it on Fairmont road.

Chris Shafer is to build a garage in Grundy Center, Ia. Construction will be brick and concrete.

L. C. French and N. E. Keister of Trosky, Mich., are about to enter the garage business in White, S. D.

Walter Matthews of Healdsburg, Cal., has purchased the interest of F. F. Fritsche in the Sonoma Garage.

C. Y. Morrow, who has been half owner in the Central Garage, in Selma, Cal., has bought full control; his partner, M. Wertzler, has retired from the business.

L. J. Anderson of Manitowoc, Wis., has had plans prepared for a garage, 96 x 43 feet; it will cost $3,500.

A. E. Campe has applied for permission to build a garage in Norfolk, Va. He estimates the cost at $1,500.

Louis Schloss is about to enter the garage business in Wilkes-Barre, Pa. He will locate at 84 West Ross street.

The Trojan Garage, 88 3d street, Troy, N. Y., has gone out of business; the incorporation, however, still exists.

Acme Motor Delivery Co. just has been formed in Cincinnati. O.; the business will include the operation of a garage.

Permission has been granted to P. Laplante, of William avenue, Winnipeg, Man., to erect a garage; it will cost $5,000.

A. C. Populas has secured plans for a one-story garage, 50 x 20 feet, to be erected in Council Bluffs, Ia. The cost will be $5,000.

The Tarboro (N. C.) Motor Co. has been purchased by F. T. Brandt; he will improve the premises and continue the business

J. M. Evans has entered the selling field in Omaha, Neb. He will handle the Overland line in that city and adjacent territory.

W. W. Hartwig proposes constructing a garage at 14th and Porter streets, Detroit, Mich. It will represent an expenditure of $3,000.

Frank Bergamo of Newark, N. J., is to erect a garage, 52 x 33 feet, at 232-4 Academy street; it will require an expenditure of $2,800.

Hawk & Lydy of Norwalk, O., have sold the Big Garage on South Hester street to John V. Metz; Metz has already assumed possession.

A. S. Hamilton of Toronto, Ont., has secured permission to build a two-story garage at 10-14 Alexander avenue; it will cost $20,000.

Homer Waymon, who has been in the automobile business in Beardsley, Ill., has assumed the management of the Pekin (Ill.) Auto Co.

J. R. Summers and R. W. Miller, automobile salesmen, have entered the trade for themselves in Tiffin, O. They have the R. C. H. agency.

The Robinson-Painter Co., of Pittsburgh, Pa., has been reorganized under the style Painter-Dunn Co. The new firm has the Overland agency.

H. Jason Knapp has withdrawn from the Twin City Auto Co., of Tonawanda, N. Y. Walter Arenz, the other partner, will continue the business.

Osceola Garage is the style of a new business about to open up in Kissimmee, Fla. The building, now being erected, will measure 60 x 110 feet.

The Home Auto & Machine Co. in Visalia, Cal., has been purchased by A. L. Carney; he has reopened the business under the style Homo Garage.

M. H. Perin, of Cincinnati, O., has obtained permission to build a two-story brick and stone garage at 1106-8 Race street; the estimated cost is $23,000.

Alvin Loetscher of Livingston, Mont., has sold an interest in his garage to Robert Hornbeck; the latter will identify himself actively with the business.

Eugene L. Caton and C. D. Brewster have entered the selling field at 758 Main street, Worcester, Mass. They are handling the Pope-Hartford line.

H. Fettel of Brooklyn, N. Y., has been granted authority to erect a one-story brick garage; the site specified is at Nostrand avenue and Hawthorne street.

Convent Garage is the style of a business which just has been opened at 457-59 West 150th street, New York City; F. Dannemann & Son are the proprietors.

Lizzie Sauer Dunston has been granted permission to erect a garage at Broad and Allison streets, Richmond, Va. The plans call for an expenditure of $15,000.

Frederick E. Murphy is to build a two and three-story garage, 37 x 100 feet, at 3rd street and Third avenue, Minneapolis, Minn. The cost is placed at $25,000.

David Chandler of Pontiac, Mich., has purchased of Ellsworth Cook a half interest in the Cullom Garage in that city; a new concrete building is contemplated.

Walter H. Wilson has had plans prepared for a garage which he will erect at 1515-17 South Wabash avenue, Chicago; it will represent an expenditure of $15,150.

A new taxicab company has been launched in Trenton, N. J., by Harry Snook, Thomas Harris and others; the garage is at South Warren and State streets.

Capt. C. A. Boyne of Toronto, Ont., has secured permission to erect a garage at 159-61 Richmond street, west; his application stated that the cost would be $9,000.

Theodore Reyer of Ann Arbor, Mich., has been granted permission to build a one-story brick garage at 2328-30 Woodward avenue, Detroit; it will cost $7,500.

The Auto Exchange & Supply Co. in Tuscaloosa, Ala., has been taken over by

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R. A. Stimson; he will continue the business under the style of Stimson Garage & Repair Co.

J. F. Avenell of Fowler, Cal., is erecting a garage, 50 x 75 feet, at 8th and Merced streets.

Hugh Brown of Eagle Grove, Ia., has sold the Eagle Auto Co. to Robinson & Smalley; they will improve and enlarge the premises and will continue the business.

A. R. Sweet, formerly a member of the garage firm of Smith & Sweet, in Modesto, Cal., has sold his share of the business to C. C. Parks; the firm now will be known as Smith & Parks.

Fred C. Oliver has been placed in charge of the truck department of the New York branch of the Locomobile Co. of America. His territory embraces New York City and environment.

The Sioux City (Ia.) Stock Yards Co. is erecting a garage which will be operated by the Stock Yards Automobile Co., a new concern; the business, also, will include the Ohio agency. The building will have 7,500 feet of floor space.

The Dennis Motor Co., which recently was organized in Toledo, O., has opened a sales establishment at 15th street and Madison avenue, with floor space 80 x 100 feet; Rambler, Lozier, Cino and Detroit electrics are handled.

Fred M. Boyd, formerly connected with the Curtin-Williams Automobile Co. in Columbus, O., has become a partner in the agency of G. L. Sitgreaves; the new firm has taken on the Mercer, in addition to the Apperson and Simplex.

Charles Harris, of Easthampton, Mass., has purchased what was known as the Warner & Dibble factory in that city, which will be largely utilized for the manufacture of automobile wheels. He also will devote a portion of it to general machine work.

The Foster-Lawrence Co. and the Morgan-Bond Co., automobile agencies in St. Paul, Minn., have secured a joint location at 197 West 5th street; they will add to their activities by conducting a joint garage but will maintain their selling ends separately.

Frank P. McLellan, for several years connected with the automobile trade in Indianapolis, Ind., has taken Oscar Wagner as a partner and Sept. 1 will branch out under the style McLellan Auto Repair Shop; the business will be located at 315 Susquehanna street. The firm has secured the Indiana agency for Marvel carburetters.

William J. Montgomery and John Mano, constituting the firm of Montgomery & Mano, operators of the Florence Garage at 207 West 75th street, New York City, have filed a petition in bankruptcy; the firm's liabilities are given as $1,565 and the assets $572. Besides these, Montgomery has individual assets and liabilities of $2,000 and $7,048, respectively, while Mano has individual liabilities of $695.

MEN WHO HAVE SHIFTED POSITIONS

Resignations and Promotions That Served to Place Many Workers in New Places —Few Leave the Trade.

George Fitzsimmons has resigned as sales manager of the E. R. Thomas Motor Car Co., of Buffalo, N. Y.

George White has been appointed to the position of assistant sales manager of the E. R. Thomas Motor Car Co., of Buffalo, N. Y.

Edward P. Hammond, secretary and treasurer of the Gemmer Mfg. Co., of Detroit, Mich., has been elected a director of the Peninsular State Bank.

Warren E. Griffith has been appointed assistant sales manager for the Ohio Electric Car Co., of Toledo. Formerly he was in charge of the motorcycle department of the Blevins Auto Sales Co.

F. A. Rhodes has been appointed Eastern travelling factory representative for the Ohio Motor Car Co., of Cincinnati. He formerly was connected with the Enger Motor Car Co., of the same city.

L. Clyde Smith, who is assistant to the director of advertising of the General Motors Co., Detroit, has been given other duties. He has been made advertising manager for the Olds Motor Works, Lansing, Mich.

Clinton Hunter has been appointed manager of the Chicago branch of the Olds Motor Works. He succeeds J. Hall, who has been made sales manager for the company with headquarters at the factory in Lansing, Mich.

F. S. Rowan has been appointed advertising manager of the Clarke-Carter Automobile Co., Jackson, Mich., which produces Cutting cars. His previous experience embraces a number of years at newspaper work.

W. H. Moore, who was manager of the sales department of the Gramm Motor Truck Co., of Lima, O., has resigned in order to become general sales manager for the recently formed Gramm-Bernstein Co., of the same city.

Charles E. Davis, formerly of the Warner Gear Co., of Muncie, Ind., has been appointed general manager of the automobile department of the American Locomotive Co. His headquarters will be at the factory in Providence, R. I.

Oscar R. Ewing has resigned as head of the advertising department of the Nyberg Automobile Works, of Anderson, Ind. He is succeeded by C. A. Lawrence, whose previous experience covers a term of years as city editor of a morning newspaper.

Bradley Sargent has been made traveling sales manager of the San Francisco branch of the R-C-H Corporation. His territory will embrace the Northern California district. Charles Sargent, his brother, has been appointed to a similar position and will cover Central California, as far South as Bakersfield.

J. M. Ward, who for the past two years has been associated with the Waverley Co., of Indianapolis, has been appointed assistant sales manager for the American Motors Co. Ward also is secretary of the Indiana Automobile Manufacturers' Association

Although first information had it that Harry Fosdick, who resigned from the Stevens-Duryea Co. to become affiliated with the Hupp Motor Car Co., would have as his title "assistant sales manager," it now appears that his duties are to be more comprehensive. He has been made assistant general manager of the company, with particular reference to handling the selling plans and agency relations.

Judgment Against Troy Garage for Oil.

Charging that the Union Garage of Troy, N. Y., failed to pay for oil sold and delivered to it, the Indian Refining Co. brought suit in the Supreme Court for New York County and this week filed judgment; the amount is $170.77.

U. S. Rubber Shares Now "on 'Change."

The list of rubber securities traded in on the New York Stock Exchange has been increased by the admission of the United States Rubber Co.'s subscription receipts, full paid, for first preferred stock.

Recent Losses by Fire.

Cleveland, O.—Higbee Co. garage damaged. Loss, $15,000.

Warren, Pa.—Union Garage, destroyed. Loss unknown.

Geneseo, N. Y.—Court Street Garage, destroyed. Loss unknown.

Hanson, Mass.—Fuller & Keene, garage destroyed. Loss, $20,000.

Laporte, Ind.—M. Rumely Co., part of plant destroyed. Loss, $25,000.

Buffalo, N. Y.—T. H. Vivian, 140 Elmwood avenue, garage damaged and two cars destroyed. Loss, $4,000.

Rochester, N. Y.—Cornhill Garage, 360 Plymouth avenue, garage and several cars damaged. Loss, $2,250.

Cleveland, O.—Carnegie Automobile Livery, George C. Bell's and William Sutherland's stable and garage destroyed. Loss, $50,000.

San Francisco, Cal.—A. E. Lattimore, Golden Gate avenue and Franklin street, repair shop and supply store destroyed. Loss $100,000.

Changes in Name and Capitalization.

Chicago, Ill.—Herreshoff Motor Co., from $500 to $15,000.

Dallas, Tex.—Dallas Motor Car Co. to Cole Motor Car Co.

Springfield, Ohio.—Foos Gas Engine Co. from $260,000 to $310,000.

Detroit, Mich.—Michigan Motor Specialties Co., from $20,000 to $75,000.

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THE MOTOR WORLD

PUBLISHED EVERY THURSDAY BY

The Motor World Publishing Company
1600 BROADWAY, NEW YORK, N. Y.

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Subscription, Per Annum (Postage Paid) $2.00
Single Copies (Postage Paid) . . . . . 10 Cents
Foreign and Canadian Subscriptions $3.00
Invariably in Advance.

Postage Stamps will be accepted in payment for subscriptions. Checks, Drafts and Money Orders should be made payable to The Motor World Publishing Co.

☞Change of advertisements is not guaranteed unless copy therefor is in hand on SATURDAY preceding the date of publication.

Contributions concerning any subject of automobile interest are invited and, if acceptable, will be paid for; or, if unavailable, will be returned provided they are accompanied by return postage.

Cable Address, "MOTORWORLD," NEW YORK.

Entered as second-class matter at the New York Post Office, November, 1900.

NEW YORK, AUGUST 22, 1912

DIE-CASTING AS THE FUTURE MAY SEE IT.

Great things rarely have great beginnings, and in most cases even those most concerned in the small beginnings of great things fail to realize the full extent of the future possibilities and the possible ramifications opened up by their preliminary work, or the effect upon future industries. All of which may be somewhat trite, but is given new interest by a little thoughtful consideration of the possibilities—perhaps it is not going too far to say probabilities—of the future of die-casting and allied processes. The complexity of the problems that had to be solved before die-casting could be placed upon a commercial basis, and the fact that more or less secrecy has been thrown about the precise methods by which the difficulties have been swept away doubtless militated against the more rapid advance of the art; but time is bringing the remedy, and with a more intimate knowledge will come developments as yet only dreamed of.

Since men began to dig the metals out of the earth and, with infinite pains and vast expenditure of time, to work them into useful forms, their best endeavors have been directed toward the elimination of intermediate steps in the various processes, or the combination of two or more processes, which amounts to the same thing in the end. Every elimination means economy of time, labor and money. The originators of the die-casting process, eliminating as it does much expensive machine work, doubtless saw clearly the vast importance of producing complex metal parts, absolutely finished, direct from moulds, in soft metal. There seems no good reason, however, why the intelligence of man should not be equal to the task of extending the process to embrace harder and more durable materials; indeed, the beginning already has been made in the forming process by which brass is shaped and absolutely finished, ready for use without machining or tooling, in one operation. The rather close resemblance of the process to the die forging that is in common use for the manufacture of many motor car parts instantly suggests the possibility of forming steel parts by some analogous method, so that intermediate machining and finishing processes may be eliminated. Of course it is a long step from the die-forming of soft brass to the production of perfect parts made of the toughest material that human skill and knowledge has been able to produce, but it is no whit longer than many other scientific steps that already have been taken, and the vast possibilities latent in a process for the die-forming of such parts as gears, cams, crankshafts and a thousand other motor car components—perhaps even to finished cylinders and pistons—make the field of endeavor one that is sure to be assiduously cultivated sooner or later.

SIDESWAY; ITS EFFECT ON TIRE WEAR.

The increasing popularity of the underhung type of construction, whether the frame of a vehicle itself is hung below the axles or merely the rear springs are so supported, opens an interesting question anent the effect of body sway on tire wear. All things considered, it would seem that the car in which the body is supported at a comparative height from the roadway might have the advantage that wear on the tires would be less for the reason that the higher body would correspond to a tuning fork loaded further away from its base of support and consequently would have a slower period of cross vibration. On the other hand, the higher car would have a much greater tendency to sidesway, and it is not unlikely that the effect of the sidesway would almost if not quite counteract the effect of the slower period of cross vibration. Unfortunately there are no accurate data available regarding the performance of overhung and underhung cars as regards tire wear, and it is practically impossible to draw conclusions from mere opinions, though the subject is an interesting one and might well be thoroughly investigated with a view to ascertaining positively which system of construction actually is the better, judging merely from the viewpoint of the man who pays the tire bills.

NEW "SIXES" THAT BREED NEW "FOURS."

Despite the tendency of the modern automobile engineer to start anew when a really new product is to be evolved, instead of accepting the features of an older product, modifying them and adding a few new ones, it is comparatively plain that the addition of a new six-cylinder motor to a line of four-cylinder products leaves an excellent opening for the addition of a new "four" as well, a fact which no inconsiderable number of manufacturers have been quick to appreciate. Of course the production of a six-cylinder motor involves problems that are foreign to the production of a "four," though once they are solved it becomes a simple matter to modify the design in the slight amount necessary to permit the elimination of two cylinders and the building of a new four-cylinder model from practically the same patterns and using practically the same parts. Obviously, the plan is applicable only where cylinders are cast separately or in pairs.

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DENIES KENOSHA FACTORY RUMOR

United States Tire Declares Site of Fifth Plant Not Yet Chosen—Other Factories Are Enlarged.

Although it is firmly established that the United States Tire Co. eventually will erect another mammoth factory, it still is unsettled just where it will be located, despite the fact that rumor has left few of the larger cities which have not already received it. The latest rumor had it that the plant would be located in Kenosha, Wis., and though it is known that negotiations at one time were in progress for the establishment of the plant in that city, it is denied that there is likelihood of anything ever coming of the rumor. Incidentally, it is made very plain by officials of the company that when the factory materializes it will not in any way affect the operation of the four other plants which at present are located in Detroit, Hartford, Providence and Indianapolis; though the plans for the new factory make provision for a really tremendous plant, the capacity of which will be nearly equal to the combined capacities of the other four factories, the older institutions will be continued full blast.

Indicative of the increasing volume of business that is being done, additions to the four existing plants almost daily are being made, the newest expansion being at the Detroit plant. Within the past week the adjoining building, which formerly was occupied by the General Motors Truck Co., has been leased, and it will be used as a warehouse. The Hartford plant also shortly will be increased in size, plans having been perfected for the construction of a model power house, which will be preliminary to the erection of a new manufacturing building, five stories in height and providing six floors, including a basement. The dimensions of the building will be 260 x 90 feet, and an additional 137,000 square feet of manufacturing space will be provided. The building will be used exclusively for the manufacture of automobile tires. The new power house will be built of concrete and steel, 108 x 72 feet on the ground and 80 feet in height. It is expected that when the alterations have been completed the force of men employed will be practically double, being increased from 1,500 to approximately 3,000.

La France Perfects Reorganization Plan.

Under the reorganization plan of the American-La France Engine Co., of Elmira, N. Y., which produces the greater portion of the steam fire engines in use throughout the United States and which also holds a license under which the Manley hydraulic drive is produced, present bondholders will receive 100 per cent. of new 7 per cent. preferred stock and 33 1-3 per cent. in common stock. Preferred stockholders will receive 50 per cent. in new 7 per cent. preferred and 33 1-3 per cent. in new common stock, and holders of common stock will receive 30 per cent. in new common, in exchange for their old stock. Of the new preferred stock which will be issued, $600,000 will be sold at par for cash, with a bonus of 100 per cent. of the new common stock. The new issue, which already has been underwritten by Wall Street interests, will be offered to present stockholders for subscription on a basis of 4 shares of the new preferred to each 10 shares of present preferred, and 2 shares of the new preferred to each 10 shares of present common. Although it is expected that this plan will become operative, its adoption requires the ratification of all holders of outstanding bonds.

Detroit Rim Company to Expand.

At the annual meeting of the Detroit Demountable Rim Co., which occurred last week, A. H. Goss was elected treasurer and general manager to succeed Harry M. Snyder, who has resigned to become affiliated with the Reo Motor Car Co., of Lansing, Mich. Chester C. Harbridge, who has been vice-president of the company since its organization a little over a year ago, was elected president. Having obtained an enviable local reputation, the company proposes to branch out and shortly will invade the automobile field in earnest.

Body Makers to Remove to Youngstown.

If the plans which at present are brewing come to a definite head, it is altogether likely that the Pressed Steel Products Co., which at present manufactures automobile bodies in Cleveland, O., will remove bodily from that city to Youngstown, in the same state. Already plans have been drawn for two factory buildings and an office building, and efforts are being exerted to influence the removal of the body factory to Youngstown, where it is claimed the center of the sheet steel district is located and where, for this reason, deliveries of bodies would be expedited.

Commercial Establishes New York Branch.

The Commercial Truck Co. of America, which has its headquarters and factory in Philadelphia, Pa., where a line of four-wheel drive electric trucks, ranging in capacity from 500 pounds to 7 tons is produced, has established a New York City branch in the Goodrich building at 1780 Broadway. J. M. Gallagher is in charge. Heretofore the company's New York business has been handled from the main offices of the company, which are in Philadelphia.

Ackley Made Treasurer of Studebaker.

M. B. Ackley has been appointed treasurer of the automobile division of the Studebaker Corporation, of Detroit, Mich. Formerly he was assistant auditor of the Michigan Central Railroad, but has resigned that position and will take up his new duties at once.



August 24, Uniontown, Pa.—Hill climb under the auspices of the Automobile Club of Fayette County.

August 25, Columbus, Ohio—Two-hundred-mile track race of the Columbus Automobile Club.

August 26-27, Flint, Mich—Track races under the auspices of E. A. Moross.

August 30-31, Elgin, Ill.—Road races under the auspices of the Chicago Automobile Club and the Elgin National Road Race Association.

September 1-2, St. Louis, Mo.—Track races promoted by the Universal Exposition Co.

September 2, Washington, D. C.—Motor truck parade conducted by the Washington Post.

September 3-6, Chicago, Ill.—Chicago Motor Club's reliability run for commercial vehicles.

September 7, Hamline, Minn.—Track races promoted by the Minnesota State Fair Association.

September 7-9, Santa Clara, Cal.—Road races under the auspices of the Santa Clara County Fair Association.

September 17, Milwaukee, Wis.—Grand Prize road race under the auspices of the Milwaukee Automobile Dealers' Association.

September 21, Milwaukee, Wis.—Vanderbilt Cup race on the Greenfield course, under the auspices of the Milwaukee Automobile Dealers' Association.

October 7, Detroit, Mich.—Start of the National Reliability tour to New Orleans, for the Glidden, Anderson and National trophies.

October 7-11, Chicago, Ill.—Chicago Motor Club's reliability run.

Goodyear to Amend Corporation Articles.

For the purpose of voting on a proposed amendment of the articles of incorporation of the Goodyear Tire & Rubber Co., of Akron, O., a special meeting of the stockholders has been called for September 9th. The principal amendment which it is proposed to adopt provides that the 7 per cent. cumulative, non-participating, preferred capital stock, instead of being issued and held, shall be periodically redeemed in fixed amounts subsequent to January 15th, 1915, with the right of the company, at its option, to redeem all of the stock after that date.

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THE "FIXED POST" AS A BUILDER OF BUSINESS

How Sales Cannot Come to the Dealer Who is Not on the Job—Why Sticking to Business Often Means More in the End Than Having an Attractive Line of Cars.

"Dear sir," began the Sales Manager, as with the stenographer Reilly had kindly loaned him he commenced the dictation of a letter, meanwhile endeavoring to stare out of countenance the little iron bulldog whose daily duty it was to stand guard upon the desk in Reilly's office; sometimes he—that is, the dog—felt overworked, especially on windy days, when he had to exert all his energy to keep things from blowing off the top of the desk. But since he was ever faithful he failed to see why this strange man who had invaded the office and usurped his master's seat should stare so rudely and with a trace of a scowl.

"Dear sir," he repeated, and added, "I am writing to inform you that I will be in your town the day after to-morrow, 19th inst., at 10 o'clock in the morning, and would like to meet you in your office at that time. Since I can stop but an hour, I trust I will have no difficulty in arranging this meeting with you, for there are several important matters of mutual interest I wish to take up with you."

This done, the Sales Manager requested the stenographer to send the missive by special delivery to MacDougall, one of the automobile company's dealers in a thriving little town about two hours' ride from the factory and on the opposite side of the factory city from where Reilly maintained his habitat and business. The iron dog was somewhat relieved as the intruder and the ferreous canine's master strolled from the office into the showroom.

"Must be an important engagement you have with MacDougall," commented Reilly, while he flicked a speck of dust from the shining mudguard of a new car.

"Not so very," was the reply.

"Oh!" commented Reilly, in a tone which plainly said, "I thought it might be from the letter you wrote."

"I suppose you wonder why you never get letters like that," added the Sales Manager.

"I don't know what I wondered—I guess I just wondered."

"It isn't that the business with MacDougall is so important, for the real important thing in business with MacDougall is to find MacDougall. In fact, finding MacDougall is the principal part of my work just now."

"Is that town so big you can't find a man in it?"

"I don't know. All I do know is that I am seldom able to find MacDougall in it."

"Do you ever look for him at his office?" asked Reilly.

"Look?" said the Sales Manager; "I've watched and waited for hours for that boy. In fact, I have been to his office three different times on the business I want to talk with him about and each time I've waited an hour—and no MacDougall!"

"Maybe he has too much business," suggested the dealer.

"I don't know about that, but this much is certain: Unless he gets together on his dealership business he will find he hasn't any. We can't afford to have a bad name made for ourselves and our car by having the factory represented by a man who, while he may not intend to do any harm, is working an injury to himself and us which will be years in the righting, provided it gets far enough.

"All that ails MacDougall in my estimation is that he is selfish, in a way. He thinks more of himself than he does of his business. If he wants to leave the office for the whole day he does so, and it doesn't seem to matter how busy the day is likely to be. When he started in over there he gave promise of being a rattling good dealer and of building up a trade that would be immensely profitable to himself. He has an attractive personality, and is well liked, and as soon as he set up for himself his friends began to come around, and soon his showroom was the most popular place in the whole automobile row. He had it fixed up pretty and the sales began to mount up, and he was cleaning up a good bunch of money. He worked hard, too, and whenever I went to that town MacDougall was always on the job, or if he wasn't his salesman or office girl would know right where he was and just when he would be back.

"But evidently he couldn't stand prosperity. When things got to coming good he began to neglect the business; he thought it would run itself. He began to come down later in the morning—if he came at all—and if he wanted to duck out for a whole afternoon he did it. It's poor business to hold your nose too close to the grindstone, but Macdougall seems horribly afraid to get his smeller anywhere near the grindstone.

"I first noticed it several months ago when I stopped off between trains to see how he was getting on, just to pay a friendly call. My call consisted of an hour's visit with the salesman and office girl, for, although it was the forenoon, MacDougall could not be located. I have transacted considerable business by letter, but for two months now I have been trying to see him personally. I haven't made a special trip yet, but generally have stopped off while on my way through his city. The last time I was there I spent two hours, and although it was a busy forenoon, I failed to see my man. The office girl said he had come back from lunch but went away again. While I was there three people came in to see him. One was an owner who wanted to turn in his old car and buy a new one, and, of course, the salesman could sell him the new car but he had not the authority to fix a price for the old machine. The owner walked around the salesroom for 20 minutes, looking over the pictures on the walls and incidentally casting a covetous glance at a new model which stood on the floor, and then drove away.

"The next man to come in said he had broken a steering knuckle and believed it defective and wanted a new one on right away; of course, there arose the matter of free displacement, for the car's life was still within the time of the guarantee, but the salesman, who isn't as clever as he might be, came near to offending the man and there probably would have been a dissatisfied and sore customer if I hadn't stepped in and straightened the matter out myself. If MacDougall had been there he could have done it as well; anyway, I'm not supposed to run down and take care of his business for him.

"The third man who came in didn't stay long; in fact, he didn't even come in. He stopped his car in front of the place and called out, 'Is MacDougall in?' Of course, the answer was in the negative, and although he said nothing, the look on his face said enough as he opened his muffler and went down the street. The salesman said the man had been trying to find MacDougall for a week about something that he would talk about with none but MacDougall."

"What that guy needs is a 'fixed post' order," said Reilly.

"Fixed post? What's that?" asked the Sales Manager.

"Didn't you ever hear of the new police system they have in New York where, instead of walking a beat, a man goes out and stands on one corner or in the middle of the street, so that if there is a policeman needed one always can be found?"

"It might work," replied the Sales Manager.

"The trouble is," added Reilly, "it would be difficult for you to give such an order to MacDougall, because he is not working for you. The only one who can give him such an order is himself; although, you might be able to make him see the logic of it. I met him not long ago, and he said his business was going to the bad; he lays

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it to the car; he says people are getting so they don't care to buy it, for some reason or other. I wanted to tell him why, but I didn't. But I know all about it. I made a few rules for myself when I went into business, and even if the 'fixed post' hadn't been thought of in police circles at that time, I put it in my rule book. I made a resolution that as long as I was in business I would attend to business.

"I vowed I would be on the job on time in the morning, if for no other purpose than to set an example for my employes. I resolved to stick by the shop all day unless I had business elsewhere, and when it was necessary for me to go away I always let the office girl know where I was going and when I would be back; and I always came back pretty close to when I said I would. I don't like to pat myself on the back, but you know yourself that my people are pretty well satisfied, and one reason is that since I am become the medium between them and the factory, they can always find me; and I have had them show up at the time the girl said I would be back just to see if I really would be back at that time; you know lots of people like to get little things like that on a fellow, but I fooled 'em—I was always back on time. Of course, there are times when I take a day or an afternoon off, but everyone is entitled to some recreation, and there is no objection to that.

"I wouldn't have told you this if you hadn't brought up the subject, but I went over to see MacDougall one day about selling a second-hand car I knew he had; I had a customer who was looking for a good used car. Of course, as it has been lately, MacDougall wasn't in. I stuck around for a while, and just as I was getting ready to go a man in chauffeur's togs came in and said his employer wanted MacDougall to come down and give a demonstration. The best the salesman could offer was that MacDougall and the demonstrator—both—were out, but that they would be down as soon as they came in. I asked the salesman when MacDougall went out and he said 'About 10 o'clock this morning.' It was then 3 in the afternoon. I saw the next day in one of the town's newspapers a fine story about how MacDougall and some friends had caught the biggest catch of fish seen in 'those parts' in some time. The trouble with him was that he was demonstrating for the wrong kind of fish. I go fishing for a day now and then myself, but in addition to a salesman or two to look after the shop, I incidentally leave a demonstrating car. It's a 'fixed post' for that demonstrator twenty-four hours a day."

"And outside of this, Reilly, I've often wanted to ask you why it is that you stick to our car when so many other factories are after you and offer you propositions where your commissions would be bigger. Why haven't you taken them up and dropped us?"

"Same old rule," said Reilly; "fixed post."

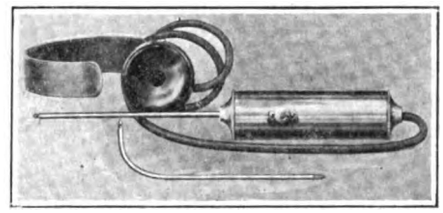
"But why 'fixed' in this case?"

"It's this: When I started in business the other factories wouldn't give me an agency, but I got yours and I've built up a business better than any of the others have now and I don't believe in switching and starting over again. It's a 'fixed post.' You know a rolling stone gathers no moss, so they say, and I think my 'moss' is in staying fixed. The only difference between this and the police business is that the 'unfixed' policeman gathered too much 'moss.'"

The two went back into the office where the Sales Manager had deposited his traveling bag; as the latter prepared to go he said, "Reilly, MacDougall will 'fix' himself or I'll fix MacDougall!" His gesture of decision consisted in picking up the little iron dog and setting him down again with a bang so loud that the little dog almost believed he had barked.

Here's the "Mechanical Stethoscope."

Aside from his ability to handle his tools, the principal asset of the expert automobile mechanic is his highly trained sense of hearing which permits of his distinguishing



BOSTON "MECHANICAL STETHOSCOPE"

between, and hence quickly locating, various and sundry motor troubles by the character and penetration of the sounds which the irregularities cause. To aid those who are not expert in the art of diagnosing motor ailments by sound and to make more expert those who already are proficient, is the purpose of the Detectorphone, or, as the maker terms it, "mechanical stethoscope," which recently has been placed on the market by the Boston Talking Machine Co., of 41 West street, that city. The constructional details of the device are simple in the extreme. It consists of a sensitive microphone connected in series with a high resistance telephone receiver through the intermediary of a dry battery and a flexible cable. Both the microphone and the battery are housed in the battery cylinder, which is fitted with a metal rod in front which enters the case through a bushing and engages with the diaphragm of the microphone. The flexible cable leads from a similar bushing in back, which can be readily removed when it is necessary to replace the battery. A push button is mounted in a convenient position on the battery case. In service, the rod of the device is pressed against the various parts of the motor while it is running, until the part which is emitting an irregular sound is located. So sensitive is the device, it is claimed, that sounds which are absolutely inaudible to the unaided ear may be instantly detected permitting the correction of faults before they have had time to develop into serious trouble.

Painted Poles to Lessen Touring Troubles.

As difficult as it has been in some localities for motorists to find their way from city to city, despite the excellent road marking systems that have been evolved and put to use by various local and national automobile clubs and several well-known manufacturers, if the scheme which at present is brewing becomes material drivers afflicted with color blindness will be the only ones who will have any great amount of trouble in adhering to the proper routes of travel.

Frank D. Lyon, who is secretary of the New York State Automobile Association and who is an active worker for good roads and the advancement of the welfare of motorists in general, has proposed and is working on a scheme to designate many of the main highways by the simple expedient of painting the top rails of fences a distinctive color. For instance, it is planned that the New York to Buffalo by way of Albany route be designated as the blue route, in which case the tops of the fences along the highways on this route all would be painted blue.

In order to carry out the scheme, it is proposed to enlist the services of the State Highway Department and the various local automobile clubs along the main routes. Inasmuch as the highway department invariably fences sections of new roads and the fences, of necessity, must be painted, it is hoped that the department may see the wisdom of the plan and consent to the use of colored paint for at least the top rails of its new fences. Telephone and telegraph companies also have been asked for their co-operation and the permission to adorn their poles with a band of the color selected for particular routes. Supplementing the painted fences and the painted poles, it is planned to place round colored disks along the principal streets of the cities through which the most traveled routes pass.

Declares Automobile Jeweler's Enemy.

The automobile, while it probably was not alone in the "crime," was made the prime offender by Steele F. Roberts, of Pittsburgh, president of the American National Retail Jewelers' Association, when last week, in Kansas City, Mo., in an address before a meeting of jewelry men he blamed the motor car for a marked falling off in the retail jewelers' business. He said the "extra" money which formerly went into jewelry and such luxuries was now used to pay for the motor car, and he also brought smiles to Kansas City's "Automobile Row" when he declared that the motor car was only a "craze" and would die out, to the benefit of the jeweler. Kansas City automobile dealers, however, have made no provision for a decreased business and at last reports were still selling automobiles.

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"SIX" HEADS NEW OAKLAND LINE

German Silver Radiator, Compressed Air Motor Starter and Double-Drop Frame Features of New Machine.

While opportunities for making sweeping changes in its line of cars did not present themselves to the Oakland Motor Car Co., of Pontiac, Mich., the rapidly increasing popularity of the six-cylinder car in the moderate priced class seemed to create a need that has been met by placing at the head of the line an entirely new model, a six-cylinder 60-horsepower machine that, though only just brought out, has been in course of preparation in the hands of the Oakland engineers for some two years. Therefore, though the car is new so far as the public is concerned, it is familiar to its builders by virtue of many trials and tests and much hard work in bringing it up to the point of development that was considered necessary before offering it for sale. The new model has been christened the "Greyhound 6-60."

In some respects the machine is reminiscent of the best in Oakland practice in the past; the motor has its cylinders cast in pairs and is of the L-head type that long has been an Oakland characteristic. Its cylinder dimensions are the same as those of the older 40-horsepower motor, 4⅛ inches bore and 4¾ inches stroke, and the power plant is of the unit type. A new Oakland feature is the motor starter, which is of the compressed air type and of a design original with the builders of the car, who have applied for patents upon it after long trials that were designed to establish its reliability under all working conditions. Another new idea is the use of German silver in the construction of the radiator.

Recognition of the advantages possessed by a low-hung car is shown in the working out of the design so as to give a very low center of gravity without, however, adopting the underhung principle. The frame is built with a double drop, which the Oakland company believes gives the advantages of underhung construction together with an amount of road clearance that is ample.

Particular attention has been given, in the new "six," to quietness, a quality that is now demanded of a good car. The low dropped frame permits the elimination of several metal parts, such as side aprons, spring cups, step hangers and running boards, which naturally reduces the tendency to rattle; two aluminum steps on each side of the car serve also as fender brackets. The wheelbase of the "6-60" is 130 inches and the wheels are 34 inches in diameter, with 4½ inch tires all round and demountable rims. The fuel tank is carried in the rear and air pressure forces the gasolene to a gravity feed tank near the Stromberg carburetter. Electricity for illumination as well as for ignition is supplied by the Deaco system, which includes a dynamo driven from the engine. There will be little difficulty in recognizing an Oakland car coming head on, for the radiator has a distinctive appearance all its own, due to the use of a V-shaped cowl which overhangs the radiator and imparts a sort of prow effect to the hood.

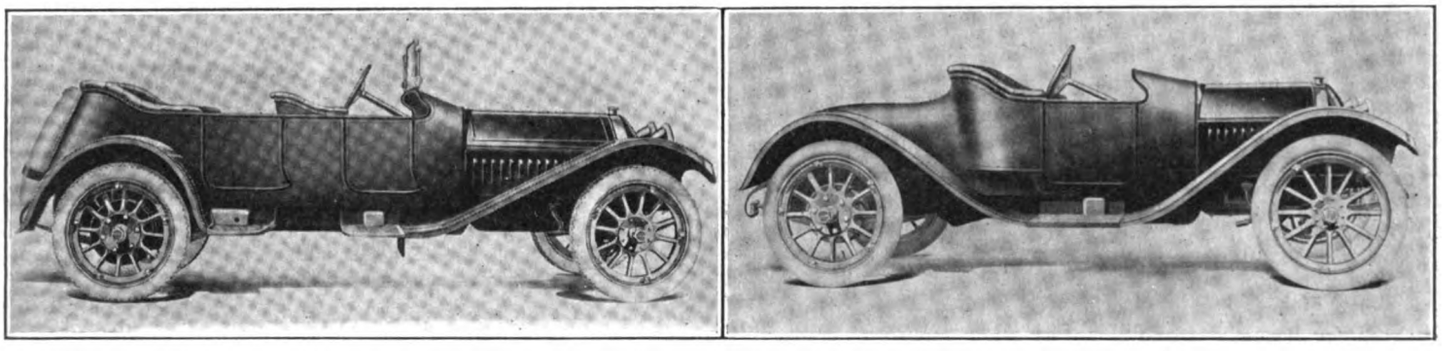
The "Greyhound 6-60" chassis will be made in four distinct styles, a seven-passenger touring car, "close-coupled" four-passenger car, roadster and five-passenger touring car, the list price, $2,400, being the same for all. Naturally the appointments are on the luxurious order, the depth of the upholstery in the touring cars, for instance, being the 10 inches that motor cars have made famous.

The smaller members of the Oakland family, constituting three models, still are Oaklands, which is to say that they embody mechanical features and exterior outlines that have established their undoubted right to continued use. Distinction in the matter of appearance is added throughout the line, however, by the same shrouded radiator that is embodied in the big car, and it is quite in the natural order of things that there should be a slight improvement in all-round general appearance and in the working out of details and little luxuries for which the demand is increasing year by year.

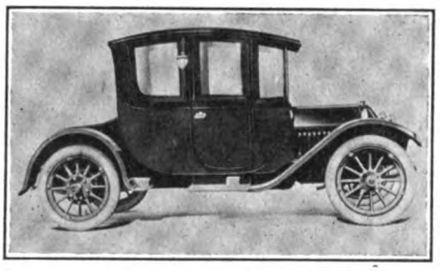
The older models were designated by the numbers 30, 40 and 45, while the corresponding new models bear the numbers 35, 40 and 42. All are of the four-cylinder type, with L-head motors and unit power plants, and mount various styles of bodies. The largest of the four-cylinder chassis, model 42, has a wheelbase of 116 inches and the same type of double-drop frame that is employed in the six-cylinder car. Similarity to the "six" also is found in the motor dimensions, the bore and stroke being 4⅛ and 4¾ inches, respectively, and the same motor starter is fitted. Drive is through a leather-faced cone clutch and three-speed selective transmission to the full-floating rear axle. Wheels are 34 inches in diameter, with 4-inch tires and demountable rims. The 21-gallon gasolene tank at the rear is under air pressure, which forces the fuel to the gravity feed tank at the motor.

One of the bodies fitted to this chassis is of the "sociable" roadster type that attracted so much attention when it appeared at the 1912 shows. The same general design is retained, with the broad seat accommodating three passengers side by side, and and big rounded after-body, in which the 37-gallon gasolene tank is housed. The body is, perhaps, a trifle more rakish and a little more graceful, and the cowl over the dash has been carried back in the middle, which seems to give the machine an extra air of refinement. A "close-coupled" four-passenger body, a four-passenger coupe and a five-passenger touring body are built on this chassis. In coupe form model 42 lists at $2,500; the other types list at $1,600 each.

Model 40 resembles model 42 in that it has a motor of the same size, unit power plant, the same wheels and tire equipment and, generally speaking, the same mechanical features. The wheelbase is shorter,



NEW OAKLAND "GREYHOUND 6-60" AND THE NEW FOUR-CYLINDER ROADSTER MODEL 42

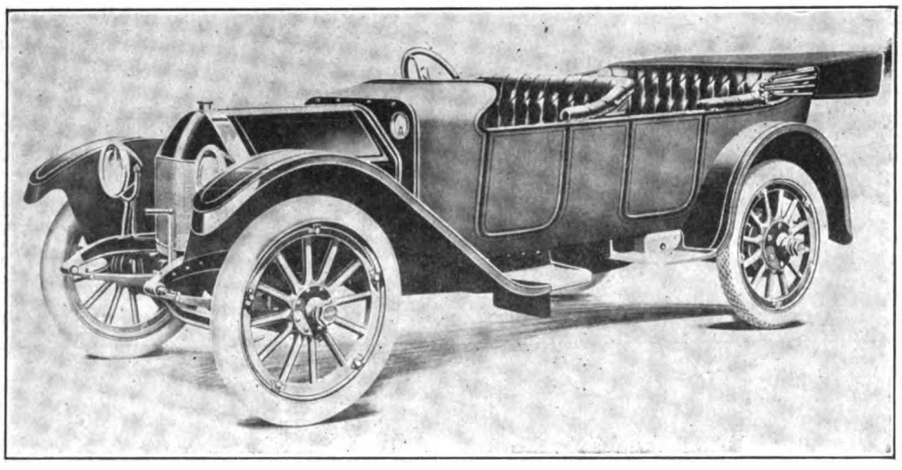


INSIDE DRIVE COUPE

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however, being 114 inches, and the rear axle is of the semi-floating type instead of full-floating. The frame is given a single drop. Ignition is by Briggs magneto. The list price is $1,450.

The longest motor stroke in the Oakland line is in the engine of the model 35 chassis; the stroke is 5 inches and the bore 3½ inches. This is the smallest car of the line, having a wheelbase of 112 inches and 32-inch wheels with 3½-inch tires which, like the tires on all other Oakland cars, are on demountable rims. Unit power plant, cone clutch, selective transmission, semi-floating rear axle with Hyatt roller bearings, Remy ignition, and a single drop frame are features of the little car—which really is not so little after all. Two bodies are mounted on this chassis, a five-passenger touring body and a three-passenger sociable, similar to the one carried on model 42. The roadster lists at an even thousand dollars and the touring car costs $75 additional. Electric lights, with a storage battery as the source of current, are part of the regular equipment of the touring car.



OAKLAND MODEL 42 TOURING CAR WHICH LISTS AT $1,600

Care That Will Eliminate Much Trouble.

It is a rather curious fact that most of the cases of "mysterious" troubles that crop up happen to persons who are prone to carelessness, and the difficulty they experience in tracing troubles is due to the fact that they go everywhere looking for the cause except to the source, which is their own "sloppiness." It is so much easier to use a dusty or dirty pail that is right at hand than to look for another one; it is so much quicker to fill the radiator with the strainer out, incidentally admitting a few chips and straws, than to take a little more time and rinse out the pail; it is so much less fatiguing when starting out to say, "Oh, I guess we've got enough" and let it go at that than to investigate the amount of fuel and oil in the tanks; it is so much easier, when a connecting rod begins to knock a little, to "let it run for a while" than to "do it now," and be secured against future and probably more serious trouble, and so on ad infinitum.

GRAPHITE AND HOW IT IS OBTAINED

Government Report That Explains Where Mineral Is Found and How Mined—Isle of Ceylon Greatest Producer.

The increasing recognition of the value of graphite as a lubricant for motor car work, together with the better adaptation of graphite to this purpose and of lubricating systems to the use of graphite, makes the following account of the mining of this peculiar mineral of timely interest. The United States Geological Survey is responsible for the story of the methods used at the graphite mines of Ceylon, which produces more natural graphite than any other single country.

"The graphite is mined either from open pits or through vertical shafts connecting with underground workings. Most of the mines are not deeper than 100 feet, though a few go as deep as 400 or 500 feet. In a few mines steam pumps and hoists are employed, but as a rule the mining methods are still crude, the acme of mechanical ingenuity being reached in a windlass operated by five or six men for hoisting the graphite in a sort of tub. The workmen usually ascend and descend by means of rough wooden ladders, tied with jungle ropes and rendered exceedingly slippery by the graphite dust.

"The mineral as it comes from the pits is conveyed in bags to a dressing shed, where it is picked over and the impurities reduced to 5 or 10 per cent. It is then packed in barrels for transportation to Colombo or Galle. At these ports it is unpacked and submitted to further treatment known as "curing." The graphite merchants have fenced yards or "compounds" for the final preparation of the graphite for the market. The large lumps and the screened pieces are broken with small hatchets by Singhalese women to remove the coarser impurities, such as quartz, and are then rubbed by hand on a piece of wet burlap and finally on a piece of screening to give them a polish. Finally, various grades coming from several mines or differing in size or texture are blended to meet the requirements of purchasers.

"The poorer material is usually beaten to a powder with wooden mauls or with beaters shaped like a rolling pin and is then sorted into different grades.

"The manufacture of artificial graphite is conducted by means of the electric furnace, an anthracite coal carrying small amounts of evenly distributed impurities being the material from which the ordinary grades are made. For obtaining the purest grades of graphite, petroleum coke is substituted for anthracite. The process for the manufacture of graphite was patented in 1896 and its commercial development has been so rapid that at present the output of artificial graphite in the United States is greater than the whole domestic production of natural crystalline graphite."

Adding Paper to Prevent Overheating.

Sometimes only the thickness of a piece of thin paper lies between a hot-running bearing and coolness. For instance, a bearing may be set so that it will not be absolutely parallel with the shaft it supports, in which case two points only, at opposite ends of the bearing and at diametrically opposite positions on the circle, will show marks of heavy pressure. Rather than take any metal off the bearing it is better to put a piece of thin paper under each of the places where there is excessive pressure, which will tend to bring the bushing into line. It may be that packing up at one end will be enough, or that one piece of paper at each end will be insufficient—the latter, however, only in a bad case. Very thin hard sheet brass is better than paper if it is obtainable.

Cole Car Godfather of Linen Collar.

One way of getting a name before the public is to have it stamped upon some article of general use in such a position that the visibility of the word or words is almost forcible in its effectiveness. What is an unusual combination to promote publicity in this manner is the word "Cole" on a linen collar, the new style having been put out by Frisbie, Coon & Co., of Troy, N. Y. According to advices from the manufacturers of Cole cars, the christening of the new piece of neckwear was in honor of that car and the collar will carry the standard Cole signature.

Arrested Because He Drove Too Slowly.

Being taken into custody for getting over the speed limit has become so common in the automobile world that the man who succeeds in getting arrested for being too far on the other side of the speed limit naturally attracts some attention; this is what James Kelly, a Chicago chauffeur, did, and he was made to pay $5 and costs. His offense consisted of driving at a snail's pace in the middle of the street car tracks.

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CONDENSERS; THEIR CONSTRUCTION AND ACTION

How a Little Package of Tin-Foil and Waxed Paper Plays an Important Part in the Successful Operation of the Ignition System — Methods of Various Makers.

Like the proverbial chain which is no stronger than its weakest link, the modern motor car is no more reliable than is the weakest component part, but very much unlike the chain, each of the very many "links" which enter into the design of the vehicle requires special designing, needs computations, and entails constructional methods and trials which are altogether different from its next-door neighbor. The transmission, suspension, fuel, cooling and ignition systems each has its little peculiarities and weak points, and not a little study has been expended in strengthening the weak points and correcting the faults, so that the completed product might partake of that "one-horse chaise" form of durability.

Although each of the "links" has received its share, and of the efforts to reduce trouble to the minimum, none has borne more results than that directed toward the improvement of the ignition system. Where magneto ignition is adhered to much of the dependability of the system can be attributed to the practice with regard to the condenser, its size, location and construction, for each has its bearing upon the "fatness" of the spark which is produced, as well as upon the durability of the device itself.

To the unknowing the condenser is merely a little device made up of tinfoil and a suitable insulating material which in some mysterious manner serves to absorb a certain amount of current which otherwise would disclose itself in a spark across the contact points of the circuit breaker and cause burning of the points. The condenser is, however, more than a simple safeguard against the burning of the terminals. The length, temperature, "fatness," in fact, the whole character of the spark which ignites the mixture changes with the change in design or capacity of the device.

This is best shown in connection with the discharge of an induction coil. If the discharge points or balls are not too widely separated and the coil is in perfect working condition, the characteristic "needle" discharge with a sharp, snappy sound is observed. If, however, a condenser of suitable capacity is bridged across the gap, the spark is considerably "fattened" and assumes the "brush" form with an almost total absence of noise. A condenser of too great capacity will choke the spark. A condenser so located on an induction coil never is supplied for ignition work, though in other branches where high tension currents are used, the practice is quite common. It serves, however, to show the effect of the capacity of the device on the character of the spark produced. For ignition work the coil condenser is connected across the contact points of the circuit breaker, as is the case with the magneto.

Fully to explain the action of a condenser would necessitate the use of pages of dry, technical reading greatly embellished with mathematical formulae. Briefly, however, the action is as follows: If a coil of wire is connected to a set of batteries and the circuit closed, two separate and distinct circuits are set up in the coil and connecting wires during that short interval in which the voltage is rising from zero to the maximum. The first has its origin in the battery and flows through the coil and back again to the battery. The second circuit has its origin in the coil and is due to the "self-induction" or inductance of the coil and flows in the opposite direction to that of the circuit from the battery. Naturally, this second circuit acts as resistance to the flow of the battery circuit, and, consequently, the current which flows at the instant the circuit is made is very slight. The "back-kick," as the second current is called, is present only when the voltage of the battery current is altered and its strength depends upon the amount of fluctuation and the time. Obviously, it is greatest when the circuit is either made or broken, for at such times the voltage changes from zero to maximum, or vice versa, in the shortest possible interval. Positioning a condenser across the terminals of the contact breaker does not alter the strength of the back-kick when the circuit is made, for at that time the condenser is short-circuited and consequently ineffective. When the circuit is broken, however, the condenser acquires a "charge" from the secondary circuit or back-kick, so that, if the condenser is of the proper capacity, but little of the secondary circuit is left to form an arc across the gap formed by the opening contacts.

Essentially, therefore, the condenser performs but one duty: it absorbs the back-kick, but this performance has two effects; the first is to prevent burning of the contacts, the second to increase the "fatness" of the spark. Just how the second effect is attained readily can be comprehended when it is pointed out that, although an air gap of minute proportions is a very good insulator for low tension currents under ordinary conditions, when an arc is started by bringing the electrodes into contact and then again separating them, the resistance is very much lowered by the presence of portions of the electrodes, which are changed to the gaseous state by the heat of the arc. Hence when the electrodes of a circuit breaker not provided with a condenser are separated, the circuit is not instantly broken but continues to flow for a short interval of time—until the gap is too large for the voltage to sustain an arc —and the fluctuation of the voltage from the maximum to zero is not accomplished in the shortest possible time. Hence the voltage of the high tension current induced in the secondary winding of the magneto is not so high as would be the case were the primary more quickly broken, and the magneto acts "sluggish" or else it will not act at all.

As for the capacity of the condenser, no two magneto manufacturers agree. Some claim that if the capacity of the condenser is too great the igniting spark suffers; others, and among them are manufacturers whose products are not the least known, claim that the capacity of the condenser is limited only by the size of the space set aside for its reception; in other words, the capacity never can be so large as to work a negative effect on the igniting spark. All do agree, however, that the choice of a condenser is in nine cases out of ten a rule of thumb process; various capacities are tried until one producing the best results under all conditions of armature speed is found.

As for the location of the device, all are agreed that it should be placed where it is perfectly protected from moisture, oil, dust, mechanical injury, and, above all, from the hands of those who are fond of "tinkering." Time was when the location was in nearly all cases in the base of the magneto, but the condensers so located are at the present time not common, for the reason that when so located it is difficult to provide adequate protection from moisture and oil. At present manufacturers lean toward locations either on the armature or in the coil box or in a specially provided casing between the poles of the magnets.

Naturally the shape of the condenser depends upon the location, although the materials which enter into the construction also act as a factor in deciding the form which the device assumes. With the Eisemann magneto, in which the condenser is located on the armature and is made up of the usual tinfoil sheets, the diaelectric being mica, and it but natural that the device should take a cylindrical form, the diameter is slightly smaller than the diameter of the armature. The tinfoil sheets are cut in rings which are but slightly smaller in area than the mica disks of the same form. The proper connections to the tinfoil rings are assured by small tabs or flaps which pro-

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trude from between the insulation, tabs from alternate rings on opposite sides, and are soldered together and to the connecting wire. None but the best of imported mica is used in the construction of the condenser, for the mica mined in this country, it is said, is very liable to contain streaks of metallic substances which render its use impossible where the best results are desired or expected.

With the Bosch magneto, too, the condenser is placed in a cage on the armature, where it is safe from injury. In the Bosch, however, mica is not used as the insulating medium, its place being taken by oiled silk, which, it is claimed, because of its greater uniformity of texture, gives the better results in the long run. Although the Bosch condenser is cylindrical in form, like the Eisemann, the construction is totally different. Instead of the materials being applied to each other in the form of rings and supported at right angles to the armature shaft, the alternate sheets of tinfoil and silk are wound one upon the other. A brass housing protects the device from mechanical injury.

Remy practice embraces the use of a condenser which is placed in the coil box and supported as well as insulated by the wax composition with which the box is filled. Splitdorf practice is similar, save that the condenser is covered with a steel casing, which, it is claimed, prevents loss of capacity. The condenser is formed of the usual tinfoil sheets, which are wound with the paraffin paper which forms the insulating material. After winding, the device is thoroughly impregnated with warm paraffin and pressed in a hydraulic press, so that all of the air bubbles are excluded as well as the excess of paraffin. The steel casing then is applied.

With the K-W magneto the base location is adhered to, but ample protection is afforded the device by virtue of a cover plate which fits snugly and excludes moisture and oil and prevents mechanical injury. With the Pittsfield the condenser is mounted in a special casing which is located between the magnets above the armature, where it not only is out of the way, but is easily accessible in case of necessity.

Condenser assembly requires great care, for besides the necessity of excluding the last trace of moisture from all of the component parts, the equally important problem of excluding all dust which is liable to puncture the very thin insulating sheets must be dealt with. Each plant has its own methods of carrying out the operations, and generally this part of magneto construction is carried on behind locked doors.

Quick Method of Cleaning "Bits."

The quickest and most effective method of cleaning a soldering bit is to heat it slightly and then immerse the head in a strong solution of sal ammoniac. The same process can be utilized to remove verdigris and dirt from small brass articles and will leave every portion clean and bright as new.

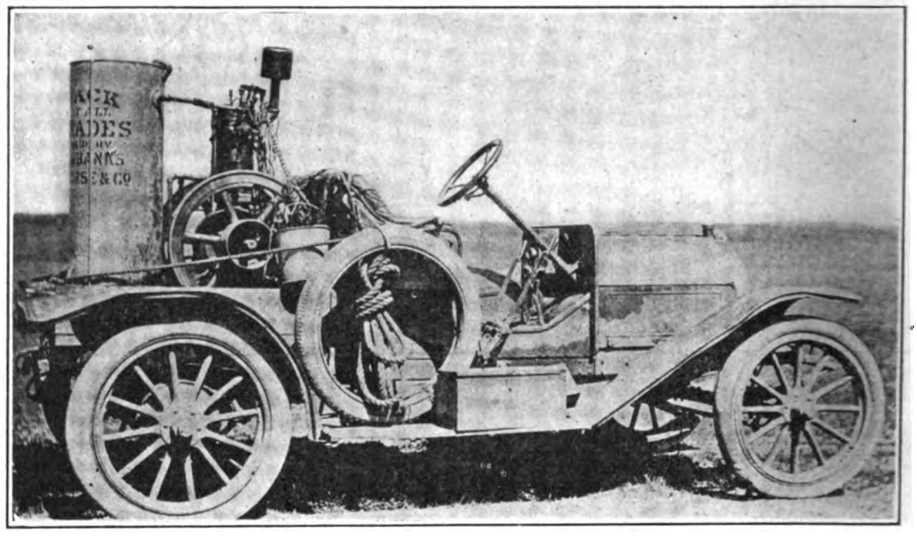
SHEEP RANCHING WITH MOTOR CARS

Automobile Story That Is All Wool and More Than a Yard Wide—Machine That Displaces 46 Horses.

There is nothing at all unusual in the mere fact of a motor car displacing and doing the work of a number of horses; in fact, it is expected of the machine. It is decidedly exceptional, however, for two machines to accomplish so much work as to enable their owner to dispense with the use of any such number of horses as 46, which is the accomplishment credited to two Studebaker "30" touring cars that were discovered on an Idaho sheep ranch by a California man who was making a transcontinental tour in a machine of the same make. Of course, all good cars are built on the assumption that they will have to stand hard work in the ordinary course of events; but no pleasure car is constructed with the idea that it is to lead a life of all work and no play, and the fact that the two cars in question are doing this very thing and giving no trouble, may be taken as an indication of the kind of stuff of which they are made and the kind of intelligence that directed their designing and building.

The tourist was puzzled, while crossing the prairie, by the sight of what at first appeared to be a prairie schooner on the hull—that is to say, the chassis—of a motor car. A nearer view of the curious thing revealed the fact that it was a motor car carrying a huge load of wool, which the owner was taking to a nearby town as a sample of the product of his ranch. Conversation with the owner developed the fact that two of the machines were in daily use doing just what horses had done formerly; they hauled material around, toted supplies from town and saved untold time in running errands. On one trip to town the machine had brought back a stationary gasolene engine weighing 900 pounds—indicating, incidentally, that the sheep man's belief in the utility of the gasolene motor was by no means limited.

In addition to robbing 46 hard-working equines of their time-honored employment, the two motor cars had the very gratifying effect of considerably shortening the working day, because of the time saved in moving from place to place on the ranch, the extend of which was such that long distances had to be covered in the course of a day's work. Notwithstanding the absence of what might be called ideal motoring conditions, and despite the fact that the cars have been handled and cared for by hands whose experience had qualified them to take care of horses, cattle and sheep rather than mechanical contrivances, no break-downs or mechanical troubles have been reported by the owner during the long time the cars have been in use.



STUDEBAKER "30" WHICH HAS DISPLACED MANY HORSES

To Have Wayside 'Phones for Motorists.

Taking a leaf out of an American book, the Motor Car Association of England has plans for the installation of a wayside telephone service in the country districts adjacent to the larger cities, so that motorists who wish to telephone to town on business while touring or who meet with accidents may be provided with economical and ready means of communication. The scheme is to erect sentry box affairs at intervals of ten miles on the roads about all important cities. The instruments in the booths will connect with the nearest exchange and calls will be free, with the exception of trunk connections, for which a reasonable charge will be made.

Rubber Tires As Knife Sharpeners.

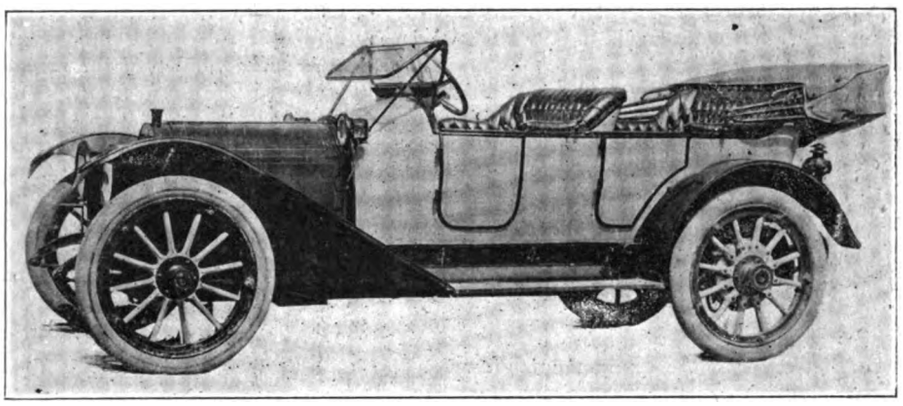
The gritty tread of a smooth tire makes a fairly good "whetstone" for putting an edge on a knife—if the edge is not too far gone to be improved by such mild treatment.

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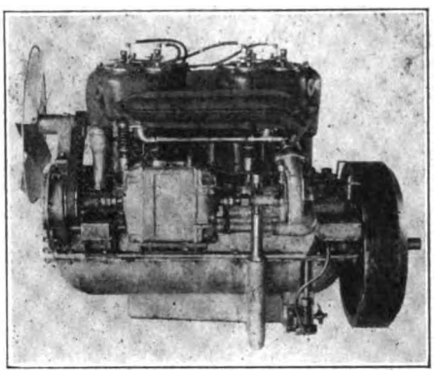
ELECTRIC GENERATOR ON REPUBLIC

Ohio Concern Adds Perfecting Item to Its Time-Tried Features—Few Changes Mark Latest Product.

Had it not been for the fact that one thing seemed necessary to make it quite complete, it is more than likely that the newest model Republic car, which is built by the Republic Motor Car Co., of Hamilton, Ohio, would have been an exact duplicate of the preceding model. There seemed no reason for making any alterations in the general design; the pair-cast, T-head cylinders of the motor, the three-speed selective gearset mounted on the rear axle, the straight-line drive with its single universal joint and the Hess-Bright ball bearing equipment were combined in a design that had given service quite good enough to warrant its retention. The one thing that seemed to be needed was a Delco generator to furnish current for ignition and for the illumination of the car, and its most advantageous installation necessitated the few changes that were made.



NEWEST REPUBLIC TOURING CAR WHICH SELLS FOR $2,350



DYNAMO POSITION ON MOTOR

As the accompanying illustration of the motor indicates quite distinctly, the generator is installed on the left, or exhaust, side of the engine and is driven by the same shaft that drives the fan and the circulating pump, the dynamo lying between the two; the shaft is driven by gears from the exhaust valve camshaft. A bracket bolted to the upper half of the crankcase, just behind the forward supporting arm, carries the dynamo. All lights on the car are electric lights, and the dynamo serves to charge the storage battery from which current is drawn for both illumination and ignition while the motor is idle; as an alternative or emergency source of ignition current a battery of dry cells is installed and is carried in an ingenious box beneath the floor on the chassis.

A description of the mechanical features of the Republic car indicates that the manufacturers have spared no pains in the endeavor to evolve a really fine car. The T-head motor, the cylinders of which are cast in pairs, has a moderately long stroke of 5 inches, the bore being 4½ inches and the rating given it is 35 to 40 horsepower; the cooling system includes a centrifugal pump and Mayo cellular radiator. Lubrication of the motor is effected by means of a self-contained system, the heart of which is a gear-driven oil pump, located outside of the crankcase, where it can be reached in case of necessity. Oil is pumped from a sump under the crankcase and circulates through the whole motor, finally draining back to the sump, where it is strained before passing to the pump.

The drive to the rear axle is of the straight-line type, with but one universal joint, which is just back of the short shaft of the leather-faced cone clutch. The propeller is enclosed in a long and substantial steel torque tube terminating in a flange which is bolted to the housing of the gearset on the forward side of the rear axle. The shaft is of vanadium steel and runs in Hess-Bright ball bearings. The gears are of 3½ per cent. nickel steel and are mounted on vanadium steel shafts which, like the propeller shaft, run in Hess-Bright bearings. Full-floating construction is embodied in the rear axle, in which more Hess-Bright bearings are used; the housing is of malleable steel. Brake drums are 14 inches in diameter; the service brakes are of the external contracting type and the emergency brakes internal expanding; all brake rods are carried inside the frame.

The springing of the car is rather an interesting feature, one of the objects sought being the low hanging of the frame without sacrificing road clearance. The front springs are quite flat, having very little camber, and are seated low down by virtue of the somewhat peculiar construction of the axle, which, instead of being dropped only in the middle, is dropped clear across, from knuckle to knuckle. The spring seats thus are brought well below the knuckles. The axle is of standard I-beam cross section, rather heavily constructed of a single steel forging. The rear springs are three-quarter elliptics and have greater camber than the front springs, which has the effect of bringing the rear of the car down to the same level as that of the front. The front springs are 40 inches long and the rear springs 45 inches long; all are 2 inches wide. The steering pivots as well as the front wheels are carried in ball bearings of the heavy-duty type.

Heavy material is employed in the building up of the steering gear, which has an important advantage in that when the worm and gear become worn on their working surfaces they can be turned and new, unworn surfaces brought into service. There are four available changes, and each time the steering gear is made practically new, so far as the worm and gear are concerned. The hand wheel is 18 inches in diameter. The gear is fitted with ball thrust bearings. The steering wheel is placed on the right side of the car, with the control levers in the middle.

The wheelbase is moderately long, being 120 inches, and the wheels are 36 inches in diameter, fitted with four-inch tires that are mounted on demountable rims. The regular Republic line includes four distinct models, all of which are mounted on the same chassis and list at the same price—$2,350. There is a standard touring car for five passengers, a small tonneau model for four passengers, with low, flush-sided torpedo body and a deep cowl back of the dashboard; a two-passenger roadster with the gasolene tank enclosed in the rounded rear part of the body and an ingenious emergency seat which pulls out of the side of the body like a drawer and when unfolded develops a back and side rest; and a raceabout—a typical speed car with bucket seats and a big gasolene tank, holding 35 gallons of fuel, mounted back of the seats. Standard equipment includes Disco motor starter, with Prest-O-Lite acetylene tank, pantasote top with curtains and cover, two-piece windshield, Warner speedometer, spare demountable rim, tire carriers, horn, robe and foot rails, complete kit of tools and the usual tire repair outfit. For body and wheel colors options are given on coach-body blue, Richelieu blue or Republic gray, with fenders, hood and radiator black; or the entire car may be had finished in battleship gray. For lamps and other metal trimmings the standard finish is black enamel and nickel.

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WHAT LAX INSPECTION MAY MEAN

The Multiplicity of Annoying Imperfections That One Man Encountered—Why They Were Unnecessary.

Probably nothing has quite so much bearing on the good name of a car as the care with which it is inspected before it finally leaves the factory and is turned over to the dealer and finally to the user. One of the most irritating things that a dealer has to do is to explain to a customer why a bolt was missing here, or a rod never connected there, both of which probably have a good deal to do with the perfect operation of the car and both of which obviously are unnecessary explanations that can be attributed to nothing save laxity in final inspection. The impression made upon a customer who brings a new car around to the service station several times to have small details which were overlooked at the factory corrected can be anything but satisfactory; and even though the dealer knows the car to be of first class design, with nothing in its construction but the best materials and the best of workmanship, he is likely to feel that much of the "ginger" has been taken from his sale-clinching arguments when small details have been overlooked at the inspection department, to crop out later.

In this connection, the experiences of a man, well identified with the engineering side of motor car construction, are illuminating, inasmuch as they tend to throw light on a subject which has come to be regarded as a real problem at not a few factories. When this particular individual's new six-cylinder car arrived from the factory—the car was one of the medium price variety—an examination revealed several "little" things that had been overlooked. Among other things, for instance, there was a squeak in the steering gear, which was caused by poor fitting and which no amount of oiling would eliminate. Considerably more play than was necessary or desirable also was present in the steering gear, and it was with difficulty that this was compensated for. The greatest fault, however, had to do with the brake equalizers, which were inoperative, so that both sets of brakes operated on only one of the wheels and violent skidding resulted. Valve tappets were set with too great a distance between them and the valve stems, so that the motor was noisy, and moreover, the valves did not open to the fullest extent nor so early as was desirable.

Among the lesser points which were overlooked was the relative position of the control levers mounted on the steering column. Owing to the quadrant being mounted eccentrically with the levers, these "jammed" at either end and nothing would induce them to retain a position at the center of the quadrant for any prolonged period. The spring which opposed the action of the foot brake pedal was so tight that driving was tiresome. A weaker spring had to be fitted. This point, however, is one which has to do with the individual taste of the driver, of course, for there are those who prefer a heavy spring and those who prefer a light one. Gear changing was extremely difficult because of the relative positions of the brake and gear levers, which were mounted so close together that to operate either virtually meant the loss of a considerable portion of the epidermis from the hand by contact with the other lever. The brake lever had to be dismounted and bent until there was sufficient clearance between the two. Both the muffler head and the cut-out valve leaked considerably, and though the leak through the head was easily remedied by simply taking up on the stay bolts, such was not the case with the cut-out, for the valve had warped because of the heat and would not seat properly.

These were the points which were noticed before the car had been driven 25 miles, any or all of which could have been corrected had the car been properly inspected before shipment. Each neglected point meant one separate "kick" for the dealer to settle, and each separate kick put the owner further and further out of sympathy with the car, the dealer and the factory.

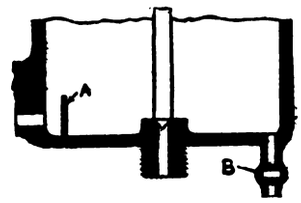
Other faults cropped out from time to time. Before the car had been driven over 100 miles, it was noticed that one of the plates which should have enclosed the gear levers where they protruded through the flooring of the car never had been put in position—a small matter in itself, though it created a reason for the owner to complain to the dealer. Later it was noticed that the spark advance to the magneto never had been connected, so that a goodly portion of the sluggish action of the motor which had been attributed to poor adjustment of the carburetter really was the direct result of operating on a retarded spark. Likewise the susceptibility of the motor to overheating even on very gradual grades was the direct outcome of the ever retarded ignition. The carburetter, however, was not wholly free from fault. As the owner expressed it, the carburetter was impossible of adjustment, though just why was not determined for some little time. It finally developed that an oversize nozzle had been fitted to the device, so that the motor never received the proper mixture.

Correcting the carburetter fault and connecting the spark advance did wonders for the operation of the motor, and the really good points of the car became more and more apparent to the one dissatisfied owner. When finally he realized that the car possessed all of the earmarks of a really first class machine and that all of the trouble he had experienced could be attributed solely to laxity in the final inspection, he became a booster for the brand of car instead of a knocker, as his first impressions of the car led him to be.

All of which emphasizes the genuine necessity for thorough inspection at the factory. Already several manufacturers have given evidence of appreciation of the necessity—one has taken an experienced salesman and elevated him to the position of final inspector of completed cars—and others slowly but surely are opening their eyes to the worth of such an institution.

To Prevent Carburetter Jet Obstructions.

Curing that which can be prevented is a sort of penny wise and pound foolish proceeding, inasmuch as it usually has to be repeated more or less often, while a preventive measure is—or at least ought to be—permanent. For instance, cleaning the dirt out of the spray jet of a carburetter is necessary if the dirt gets there; but it is far better to prevent the dirt from lodging in that very restricted passage. Notwithstanding separators and screens, water and other foreign matter will, in some way, work into the float chamber and so into the jet, and a plan whereby it can be kept



OBSTRUCTION DAM

from going any further than the float chamber is shown in the accompanying illustration, which is reproduced from the Autocar. It consists simply in erecting a little baffle-plate, A, in front of the outlet leading to the spray nozzle; thus all the gasolene that goes to the nozzle first must pass over the top of the baffle-plate. Water or anything else that is heavier than the fuel must remain at the bottom of the float chamber, as it cannot rise to the occasion, or the obstruction. Provision is made for draining off the dirt and water at intervals throught a pet-cock, B. It is obvious that the top of the baffle-plate must be sufficiently low so that it will not interfere with the flow of fuel to the jet, even when the carburetter is set for the lowest possible level. Also, it is clear that this expedient cannot be adopted unless there is sufficient space between the float and the wall of the float chamber for the baffle-plate.

Why Exhaust Valves Become "Pitted."

Besides causing overheating, sluggish running and a variety of lesser evils, a mixture that is too rich also causes rapid "pitting" of the exhaust valves. The reason is more or less obvious. The mixture is slow burning and consequently before the fuel has been entirely consumed, the valves open and the flames come in contact with the face of the valve and raise the temperature to a point where burning naturally ensues.

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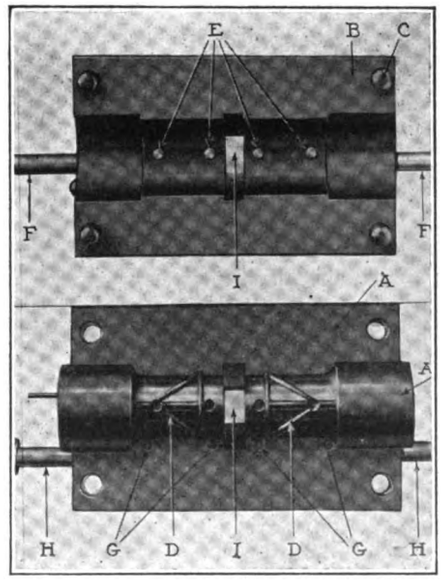
MOULDING METHODS THAT ELIMINATE MACHINING

How Expensive Machine Work Is Avoided by Making Castings in Polished Metal Moulds—Extreme Accuracy of Dimensions That Characterizes Modern Well-Made Die-Castings in Which Intricacy of Form Is No Impediment to Good Work—Later Developments in Forming Brass Parts.

Among the thousands of small metal parts used in the manufacture of motor car accessories, to say nothing of other industries, there are many that are of more or less intricate design and must be made with considerable accuracy as to their dimensions, but which are subjected to comparatively little strain. In many cases such parts, if made in the conventional way from castings and afterwards machined, would be enormously expensive—in fact, prohibitively so, commercially speaking. There also are many small metal parts that might be made of brass or cast iron and then machine finished at reasonable cost, but which really do not require the strength of those metals, and would be equally satisfactory if made of softer material. Such requirements as these, as well as countless others, are fulfilled in a peculiarly satisfactory way by the process known as die-casting. For parts that can be made of rather soft metals and which must be uniform to a degree measurable only in thousandths of an inch, the process is extremely satisfactory, while the cost, when large quantities are produced, is exceedingly low. Among the parts that are made by this remarkable process—and many of them look as little like castings as possible—are timer shells, magneto parts, small cover plates, rotary pumps for water and oil, light gears, bushings and bearings, hinges, speedometer parts, brackets, and so on almost to infinity.

To quote a prominent manufacturer of die-castings, "all die-casting processes are more or less secret and all are more or less alike." The broad principles that govern the process wherever it is carried out are identical and are quite simple, at least in the telling. The casting process is analagous to ordinary sand casting, but the moulds are made of accurately finished and polished metal and are, of course, of a permanent character, and the molten metal, instead of being poured in and allowed to settle in peace, is forced in under pressure so that all the interstices are sharply filled and the texture of the metal is improved by the close association of the particles. A die-casting, therefore, comes from its mould, or, more correctly speaking, its die, having the same finish as the surface of the die itself, and is altogether lacking in the appearance of roughness that characterizes a casting made by ordinary moulding methods. All sorts of methods are employed for producing the required pressure—compressed air, hydraulic pressure, pumps submerged in the molten metal and forcing it into the moulds, rams of various kinds, gas pressure—anything that will force the metal in and leave no corner unfilled.

Perhaps the thickest haze of mystery is that which surrounds the compositions of the metals employed by various die casting concerns. There are concerns that do not hesitate to make public the main ingredients of their alloys, but such details as exact proportions naturally are kept profoundly secret. It goes without saying that for bearings, bushings and the like



FRANKLIN CASTING DIE

babbit metal, in its various grades, is admirably suited to die-casting, and, in fact, the number of motor and other bearings made in this way is enormous, as well it might be, considering the cheapness of the process, the high quality of the work and the fact that the only labor required on such bushings is the final scraping in of the actual bearing surfaces—and, be it said very quietly, there are cases where even this is not always done. For purposes where the wearing qualities inherent in babbit are unnecessary, but more hardness and rigidity are imperative, an alloy having zinc as its main ingredient is used by the Doehler Die-Casting Co., of Brooklyn, N. Y.; by the use of tin and copper with the zinc base, greater pliability and toughness are obtained and the brittleness of the harder metal is considerably tempered. Lead, hardened with tin and antimony and mixtures in which tin is the base, also are used by this concern for various purposes, there being an alloy suitable for each class of casting. The stiffness of the alloys in which zinc predominates is surprising; they appear to be almost as strong as cast iron, in some cases, while the metals containing copper, tin and zinc, while soft, are of a brass-like toughness that differs considerably from the usual conception of "white metal."

The dies used in this industry are at the bottom of its success, and require no little skill in their designing and construction. They are, of course, made with the utmost accuracy, and not only must they be made exact as to dimensions, but there must be proper shrinkage allowance made, the shrinkage naturally differing with the grade of metal employed, and they must be so made that the castings can be withdrawn after they are made—a not unimportant consideration. The expense of making such dies is considerable in the case of an ordinary plain casting, and in the case of a very intricate design the expense is very high—so high that it is justified only by the enormous saving effected in cost of manufacturing parts in quantities and by the saving effected by the elimination of more or less expensive and time-taking machine work. The accompanying illustration gives an excellent idea of the construction of a die made by the H. H. Franklin Mfg. Co., of Syracuse, N. Y., manufacturers of the well-known Franklin car and a pioneer in the die-casting business, having commenced operations in this line some 19 years ago.

The die is one used in the casting of a bushing which forms a bearing for a shaft, and turns out the part complete, even to the oil grooves designed to distribute the lubricant over the surface of the shaft. The die consists of two parts, the upper and lower plates, held rigid when the die is closed by dowels C. On the lower half is located the main core A1 and in this are the cores for the oil groove D. These are formed by cutting down the main core so as to leave the oil groove cores raised in relief, or by slotting the main core and setting in small groove cores. The lower half also contains a set of ejector pins G operated by levers connected to shaft H. The upper half is more simple, the interior shape conforming to the outside of the bushing. This contains the cores for the dowel holes E, which are operated by levers connected

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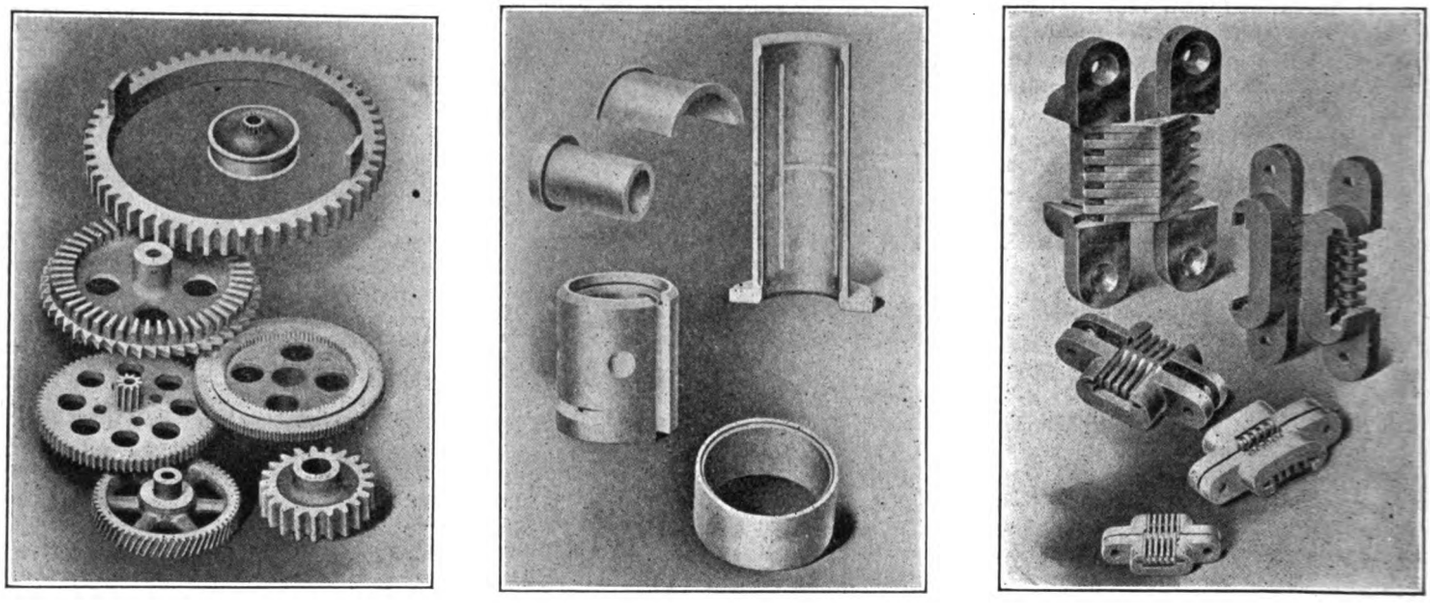
to shaft F, and also act as ejectors in case the castings stick in the upper half of the die. Both halves contain corresponding gate holes I, in which the gate operates. The closed die is fastened between the upper and lower halves of the die vice, which is placed directly over the casting machine, the cores for the dowel pin holes being thrust forward and the ejector pins being drawn dack even with face of the die plate. The gate is turned back so as to permit the entrance of the metal. The metal is then forced in, and when the die is full, sheared off with the gate, which leaves only a slight mark, sometimes imperceptible, instead of the heavy "sprew" common in sand castings. The die remains closed only long enough for the casting to become set, when it is opened and the ejector pins thrust forward, thus loosening the casting from the main core where it is usually held.

A die-casting has a peculiar hardness that is entirely apart from the natural texture of the metal, and is said to be due to the slight chilling effect of the metal die surfaces which, though maintained at a high temperature in order to avoid the too sudden cooling, which would cause defects in the finished product, nevertheless are considerably cooler than the molten metal. The pressure on the metal doubtless has its effect in producing this hardness, which is a valuable characteristic of die-cast articles. It is a curious fact that the soft metals shrink while passing from the molten state to one of mere plasticity, but after that they do not shrink. It is therefore found advantageous to remove the castings from the dies as soon as they have solidified sufficiently to retain shape, which reduces the tendency to distortion.

The Doehler company holds patents on an extremely interesting process which involves not only the use of air pressure for forcing the hot metal into the dies, but also negative pressure, or vaccum, for facilitating the rapid filling of the space with metal. There is an enclosed space above the die into which the molten metal is introduced by means which do not permit any leakage; air under pressure is admitted, forcing the metal into the die below. At the same time the air in the die is drawn out, through suitable, very small ducts, by means of an exhausting device, so that the metal is not chilled by the delay that must occur if the air has to be forced out by the entering of the metal.

In very many cases die-cast parts are made with inserts of brass or other harder metal, to be used for bearings and the like. These are inserted in places provided for them in the dies, and are prepared beforehand by the drilling of holes, for instance, into which the metal flows in the casting process, holding the brass securely in place after cooling. Similarly, brass or steel pins, rings, dowels and small wire attachments can be imbedded in the die-cast parts, eliminating the trouble and expense incident to the insertion of such parts after the castings are finished.

While the field of usefulness of die-castings made of the various soft alloys known as white metals is apparently almost limitless, it is unthinkable that such a means of forming metal should be allowed to remain confined only to soft alloys. It is not surprising, therefore, to find that the process has been applied to the manufacture of brass articles, though it has been necessary to modify it somewhat in order to obtain good results with the harder metal. The alloy itself is of the utmost importance, as might be expected, and is a yellow brass of fine color and fairly hard; it is equal to the best quality of what is technically termed "yellow metal" and is well suited to the manufacture of bearings, gears and a thousand and one other parts. The process differs from die-casting with white metal in that the brass is not melted and run into the dies, but is heated until it is in a plastic or putty-like state and then forced into the dies by heavy pressure. While the process has not been developed to the point of producing such intricate parts as are made of the softer and more easily manipulated white metal, still the field of usefulness is a tremendous one and there is no question but that there will be much further development in this direction. A brass part formed in this way is not called a casting, but is referred to as "die-formed brass," because it really is a sort of hybrid between a casting and a forging. The metal coming from the die is smooth and bright and the surface is such that, in the case of gears, for instance, absolutely no machining is required. The manufacture of brass goods by this method is carried on to a considerable extent abroad, but the Doehler company in Brooklyn is the only American concern that is using it at present.



INTRICATE AND SIMPLE DIE CASTING AS EXEMPLIFIED IN DOEHLER PRODUCTS

Rhode Island Boasts Most Good Roads.

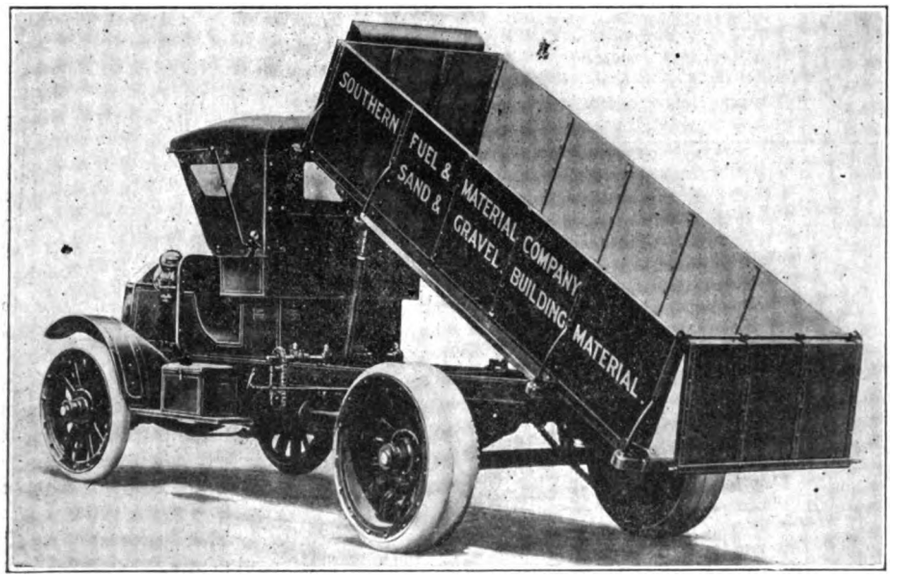
According to statistics which just have been compiled by the office of public roads in Washington, D. C., the State of Rhode Island leads all the other States in the percentage of roads that have been improved. Not less than 49.1 per cent. of the roads in the smallest of the 48 States in the Union has been improved. Massachusetts is second, with an even 49 per cent. and Indiana follows with 36.7 per cent. Next in order come Ohio, Connecticut, New Jersey, Kentucky, Vermont and California, the latter having 17.87 per cent. The States of Wisconsin, New York, Maryland, Utah, Tennessee, South Carolina, Maine and Michigan range from 16 to 10 per cent. North Dakota, which has only .23 per cent., is at the foot of the list.

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SAVING SECONDS IN DUMPING LOADS

Body That Can Be Aimed Before Discharging Its Load—Power Driven Hoist With Automatic Disengaging Gear.

Among the various and manifold motor truck details and appliances that have been adopted within the last few years few are of greater importance in saving time and so increasing earning capacity than the different forms of power hoisting gear that have been applied to trucks with dumping bodies. Carrying heavy loads which can be handled by muscular power only with the expenditure of considerable time, during which the truck stands idle, it is but natural that the available power of the motor should be turned to account for this purpose. The accompanying illustration shows how the problem is attacked by the Peerless Motor Car Co., of Cleveland, O., in the case of a five-ton truck used for hauling gravel—a material that must be handled in large quantities and with the utmost expedition in order to justify the use of a motor truck for its transportation.



PEERLESS SCREW HOIST 5-TON DUMPING TRUCK

The compound hoisting screw is made in two sections; the lower screw telescopes into the upper one, which, in turn, screws into an upper section which forms a housing for the whole when the body is down on the frame and the hoisting device is closed; in this position its length is no greater than the height of the body, inconvenient projections and unsightly protruberances thus being avoided. The power required to operate the hoist is conveyed from the main shaft, by bevel gears, to a short countershaft terminating just outside of and below the main frame of the car. A similar and parallel shaft, just above the frame, carries on its inner end a bevel gear which meshes with a bevel on the lower end of the lower section of the hoisting screw; power is transmitted from the lower to the upper shaft through sprockets and chain, as shown. In dumping a load the tail-gate is tripped and the operating lever, which starts the hoist, is thrown into working position. The body is hoisted to full height in 30 seconds. Once the load is off the driver can start the body moving downward and immediately set off on the return trip, the mechanism automatically disengaging when the body reaches the frame.

Means for quickly and easily dumping material are many and manifold, though there are no inconsiderable number of instances where special apparatus is necessary. In narrow alleyways and other restricted places, for instance, where motor trucks often are called upon to dump their loads difficulty may be experienced in getting the machines into position for unloading, and as a consequence there is money-losing delay. Loss of time also occurs in streets that, though perhaps wider, are crowded with vehicles, making the necessary manoeuvering difficult and slow. And, last but not least, urban traffic regulations frequently prohibit backing up to a curb to unload a rear-dumping body. All these difficulties seem to have been overcome by the use of the swivel dumping body, shown in the accompanying illustration, which is mounted on a Packard three-ton chassis. The body is patented and manufactured by Lawrence Bruden, of Cincinnati, O.

The simplicity of the device is one of its cardinal features, and is at once apparent from an inspection of the illustration. It consists of a rotary platform or fifth wheel upon which is mounted the tilting body, together with the manually operated mechanism for tilting it. Owing to the absence of limiting conditions it is possible to raise the body to almost any angle, so that material that is difficult to dump can be disposed of by making the pitch so steep that its adhesion to the body is overcome. Extreme accuracy in the placing of the truck for unloading is not necessary, as the turntable can be swung around until the tail-gate is pointed in the right direction, which is more easily and rapidly accomplished than the moving of the whole truck.

Another advantage is that a load dumped by this body will fall clear of the wheels, so that the truck will not have to drag itself out of the heap when starting away from the job. The body shown has a capacity of three tons and measures 9 feet long, 4 feet 6 inches wide and 2 feet 6 inches deep, all in the clear. A five-ton size is built also. It is by no means uncommon for a truck to lose a great deal of time waiting until traffic conditions permit it to take up a position permitting the load, for instance of coal, to he shot down a hole in the pavement more or less near the curb; with a swiveling body only an approximately correct position would be required, the "aiming" being accomplished by the turntable.



PACKARD SWIVEL BODY

Portland Motorists Play Indian Giver.

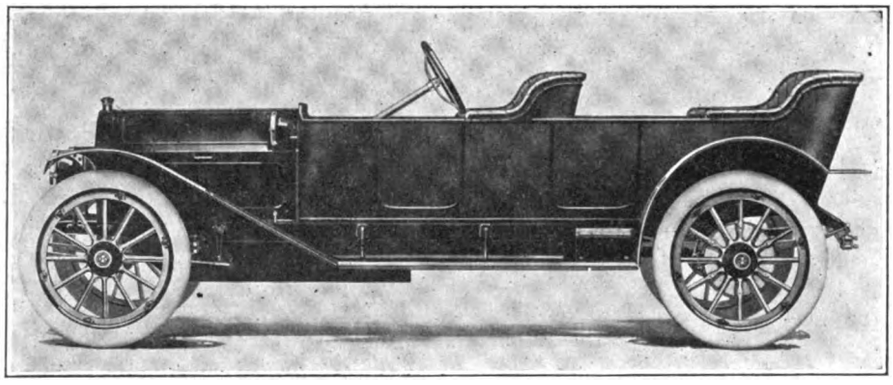
After having, so they claim, created the position of Multnomah County (Ore.) motorcycle officer, the members of the Portland Automobile Club are after the scalp of L. H. Truesdell, the incumbent, and all because he arrested a member of the organization. However, it might be added that they complain not so much of the mere arrest as they do of the allegation that Truesdell used poor judgment and misjudged the speed of the man he locked up. The victim, H. E. Seymour, was charged with driving at the rate of 40 miles an hour, although he claims he was doing no better than 25, and when the judge said "ten dollars" the president of the club, W. J. Clemens, asked that it be made $25, an amount sufficient for an appeal. The judge did twice as well as was asked and snapped out "fifty dollars" and refused to back water, so the appeal was taken with the fine at that amount.

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HERRESHOFF LAUNCHES A "SIX"

Long, Low, Rakish Craft Has Both Good Looks and Good Construction—Some Features That Are Not Common.

Whether or not there is anything in a name, it is unquestionable that there is something in the reputation that makes a name—something that leads to the expectation that anything bearing that name must partake of the reputation that is back of it. For this reason, if for no other, the Herreshoff car, built by the Herreshoff Motor Co., of Detroit, might be expected to uphold, in its particular field, the fame of the name that made Bristol famous. And it may be said at once that the new Herreshoff six-cylinder touring car, which marks the first departure of the company from four-cylinder design, is a car that merits a good deal more than a casual inspection, whether such inspection takes in merely general appearance and exterior finish, or the colder and more practical mechanical features.



HERRESHOFF "6-36" IN FIVE-PASSENGER TOURING FORM

In appearance the new car is of the long, rather low, straight-line type with flush sides and a very clean-looking exterior; the wheelbase of 124 inches, coupled with a spring suspension that includes full platform rear springs and semi-elliptics in front, carrying the chassis on three points, is calculated to render the car as easy riding as is possible. Despite the fact that the motor is of the most flexible type, the gearset provides four speeds, the direct drive being on the third speed. The controlling levers are in the center and the steering wheel is on the left side.

The motor is built on sound engineering lines, having all its cylinders cast en bloc with valves on opposite sides—that is, T-head construction; it belongs to the long-stroke class, the bore and stroke being 3⅜ inches and 4½ inches, respectively, and the rating 36 horsepower. All the valve mechanism is enclosed, after the modern fashion. Ignition is by high-tension magneto or Delco system, and lubrication by splash, with a separate oil pit for each crank, a screened oil well in the bottom of the crankcase, an oil circulating pump, and a sight feed on the dashboard through which all the oil passes in its way through the lubricating system.

Camshafts and crankshaft have three bearings each; the camshafts are cut from solid bars of steel with the cams integral. The bearings throughout the motor and some of the transmission bearings are of special Herreshoff white metal, the balance of the transmission bearings being imported ball bearings. An unusual feature is the aluminum crankcase, which is cast in one piece, according to the Herreshoff patented process.

Thirty plates of saw steel are employed in the multiple disk clutch, which runs in oil in a casing in the flywheel; drive to the rear axle is of the straight-line type. The usual two sets of brakes are fitted, one set internal expanding and the other external contracting, the drums being 14 inches in diameter and 2 inches wide. Wheels are 34 inches in diameter, front and rear, and are shod with 4-inch tires on demountable rims.

The standard finish of the sheet steel body is Royal blue with black running gear and gray wheels. Metal trimmings are finished in black enamel, including the lamps and windshield. The regular equipment of the car includes two large acetylene headlights with gas tank, two oil side lights, a combination oil and electric tail light, top with side and rear curtains and top cover, glass windshield, foot and coat rails, floor mat, 60 ampere-hour storage battery, horn, one extra demountable rim, horn, tools, tire repair outfit, tire carriers and straps, all of which is included under the list price of $1,700.

Overlapping that May Cause Starvation.

With a six-cylinder motor, only a carburetter with a low internal resistance should be used, or else some of the cylinders are likely to be starved. The starvation is caused by the overlapping of the strokes, one valve opening just before the valve of the other cylinder has closed, with a consequent result that instead of the mixture flowing into the first valve until it has a full charge, part of the charge goes to the second valve and the first is "robbed."

DIESELS TRAT ARE DIFFERENT

Modifications That Eliminate Many Parts —Economical Operation of Two-Cycle Low Compression Type.

The increasing use of the Diesel engine abroad and the economy with which it may be operated have brought it into such prominence that its general principles are pretty generally understood. But there is a type of motor, known as the semi-Diesel, that is less familiar and the name of which is decidedly misleading in that the engine differs in several important details from the true Diesel. The Diesel, which may be either two or four-cycle, compresses its charge of air to from 500 to 800 pounds pressure and then injects oil which is ignited by the heat of the compressed air. The semi-Diesel, on the other hand, is a two-cycle motor, operating on the familiar cylinder port system, which compresses its charge of pure air to about 150 pounds, and injects oil to form a combustible mixture, which is ignited by means of a hot bulb, heated for starting by means of a blow-torch and kept hot while running by the burning charges. The Diesel requires a complex compressing system for injecting the mixed air and oil and must be heavily and carefully built to withstand the enormous pressures; the semi-Diesel, on the other hand, has all the simplicity of the two-cycle motor with a fuel pump instead of a carburetter, and requires no such super-accurate work as the Diesel must have in order to operate successfully. The semi-Diesel is made in sizes as small as 7 horsepower and up to units of 60 horsepower per cylinder, runs on almost any oil, and is economical not only in first cost and in fuel consumption, but in upkeep.

Semi-Diesel motors are particularly suitable for commercial work because of their ruggedness and low cost of operation and maintenance, and for some classes of service, marine work, for instance, are peculiarly valuable because they can be reversed without the use of gearing or other complications. An idea of the running expense can be gained from the fact that a 10-horsepower motor will consume .66 of a pound of crude oil per brake horsepower hour. Like the Diesel engine, the semi-Diesel is very flexible, not only in the sense that it will run well at varying speeds, but that it will show practically the same fuel consumption per brake horsepower hour at low speeds as at the normal speed.

"Wobbly" Timers Cause Erratic Ignition.

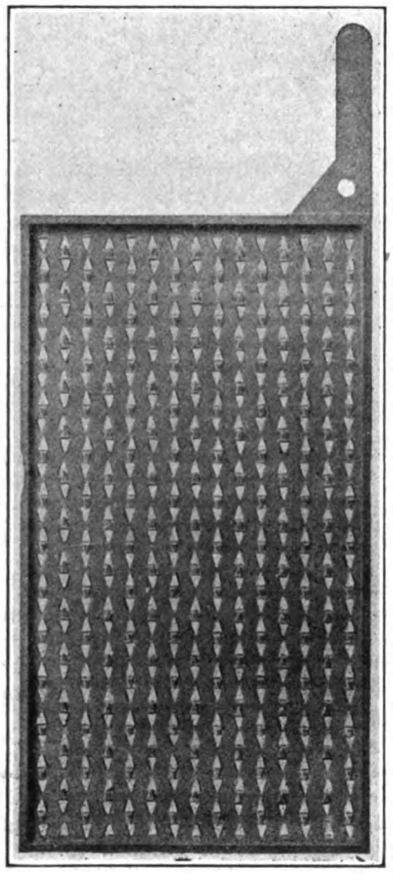
A timer that is "wobbly" or loose in its action is sure to be more or less inaccurate, causing the time of ignition to vary with each revolution of the crankshaft. A little of this sort of thing is not serious, but much of it is, and if the timer cannot be cured it ought to be replaced.

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BETTERING BATTERIES BY DEVELOPING DETAILS

Invisible Factors That Make Very Perceptible Differences in Storage Battery Efficiency — How Pasted Plate Construction of a Decade Ago Differs From That Which Obtains at Present — Early Troubles of Manufacturers and the Strenuous Methods Employed in Overcoming Them.

When the storage battery first was employed to furnish electricity for the propulsion of pleasure vehicles, some 15 or 16 years ago, such considerations as mileage capacity and length of useful life were given scant attention outside of the factories where the vehicles and the batteries were made. The vehicles were "horseless carriages" and "went" by electricity; how



C. B. NEGATIVE GRID

far they were capable of going, or how many times the batteries could be recharged before becoming worn out, were questions that were dwarfed in importance by the mere "horselessness" of the machines.

But it was not long before people began to buy electric carriages, and it was very shortly afterward that the shortcomings of the storage battery began to stick up like a good deed in a naughty world. As a matter of actual fact, the first electric pleasure cars were wonderful vehicles for their time, but for purposes of practical utility their mileage was too limited to make them of much real service. A run of fifteen miles or so was a fine piece of work, but its performance was dependent upon the traversing of level roads. At present it is not uncommon for an electric to travel upwards of 100 miles on a single charge of the battery, going over give-and-take roads. Heavy commercial vehicles, carrying from 3 to 5 tons, will run 30 to 40 miles on a charge.

To look at two storage batteries, one of the old type and one of modern construction, there is little to indicate the vast difference that exists in their capacities. In both cases the plates consist of more or less intricately designed grids of lead filled in or "pasted" with a cement-like substance, the basis of which is oxide of lead, which undergoes a chemical change under the action of the charging current and, when the terminals are connected for discharging, sets up a contrary reaction which results in the production of a current almost as strong as the charging current.

The story of the improvement of the lead battery is peculiarly a story of detailed improvement. It is quite true that the battery, as a whole, is practically what it was 15 years ago; but the materials used in its manufacture, and the manner of using them, are so greatly improved that there is no comparison between them. To begin with, the manufacture of batteries on a commercial scale necessitated the purchase of oxide of lead from manufacturers who turned it out in large quantities for other industries. But the oxides prepared in the experimental laboratories differed vastly from the commercial oxides, and the difference, of course, was on the wrong side. And furthermore, the quality of the commercial oxide was far from uniform.

In the course of its early work, the Electric Storage Battery Co., of Philadelphia, manufacturers of the Exide battery, found that while excellent results might be obtained from plates made up and pasted with one particular lot of oxide, plates made in exactly the same way from another lot of oxide, supposedly of exactly the same chemical analysis would prove miserably deficient. The oxide manufacturers would declare that there was absolutely no difference; that both lots were made in exactly the same way to the same specifications. The upshot of it was that the battery makers found it necessary to analyze samples from every keg of oxide used. Even more radical was the way in which the Gould Storage Battery Co., of New York, worked for a solution of its oxide problem. This battery involves the use of a peculiar paste, which has unusual qualities. Laboratory experiments were made in order to work out the right composition, and when the proper ingredients and processes had been determined, the specifications were submitted to the manufacturers, who promptly threw up their hands and declared that the



C. B. POSITIVE GRID

conditions were ridiculous from a manufacturing point of view. Finally, the Gould company was forced to first find a manufacturer whose plant was adapted for carrying out the work, and then show him how to do it. In this way excellent results were obtained.

The importance of the paste or, as it is technically termed, the active material, in the plates hardly can be overestimated. Upon it depends the economic action of the battery; when the battery is being discharged the sulphuric acid in the electrolyte works into the active material, leaving be-

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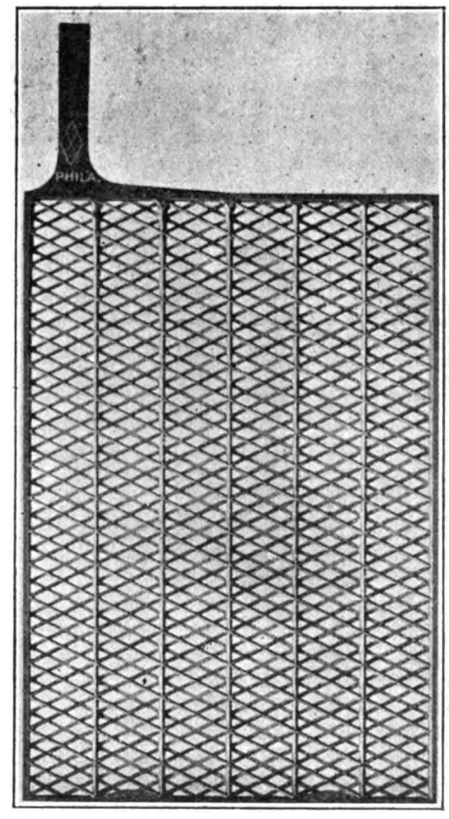
hind the water, which predominates in the solution. In order to act on the paste the acid must get to it, and this involves a slight softening of the material on the surface, and the softening finally results in the disintegration of the material, which flakes off and falls to the bottom. If the active material is too hard the acid penetrates it only with difficulty, and the battery is sluggish and weak in its action.

If, on the other hand, the material is very soft, the battery will, perhaps, give fine results in the way of current production, but its life will be very short owing to the rapid flaking off of the material. The problem, then, is to strike a happy medium. The Gould company, however, has worked out the problem in a different way. The active material used is extremely hard, but has the peculiar property of softening slightly at the surface, just deep enough to permit sufficient action by the acid, while the interior remains perfectly hard. As the surface, in time, flakes off and falls to the bottom of the cell, the softening proceeds a little deeper, so that there is constantly maintained a layer of just the proper thickness for adequate action, but the hard interior maintains the stiffness of the plate that is so important, prevents the rapid disintegration of the active material and makes the very last particle of the paste available for use, owing to its cohesive qualities.

Any cell of storage battery, regardless of its size or the number of plates it contains, will show approximately two volts on the meter; but the amperage, or the volume of current, is dependent upon the area of surface presented by the plates. Therefore the more plates there are in a cell the greater will be its capacity, because of the greater surface exposed to electrolytic action. But the more plates there are in a cell the heavier it will be, and the weight of a storage battery, with its solid masses of lead oxide and of electrolyte, is quite a serious matter. The reduction of weight in proportion to the output of the battery —or, to reverse the statement, the increase of the output in proportion to the weight—therefore could be brought about by making the plates thinner and putting more of them in a cell, which will, of course, increase the area of exposed surface per unit of weight. It was at first feared—and, in fact, found to be the case in not a few instances—that thin plates would not stand the vibration of road work, would have too short a life to be of practical value and would have a tendency to buckle and become deformed under heavy service conditions.

Once the earlier and more serious difficulties associated with the practical use of storage batteries were overcome, manufacturers began to look about for some means of materially reducing weight in proportion to capacity, and the idea of reducing the thickness of the plates naturally was given early consideration. It was at first feared—and, in many cases it was found that such fears were by no means groundless—that plates of less than the standard thickness would not have sufficient stiffness to withstand the vibration of rough road service, would tend to buckle and become deformed under stress of the heavy demands of commercial vehicle work and, in short, would be too short-lived for general use.

The Philadelphia Storage Battery Co., of Philadelphia, Pa., which was among the earliest to take up the thin plate seriously and is a firm believer in its practicability, even for heavy truck work, was a little surprised to find that even a very considerable reduction of thickness did not interfere with stiffness sufficiently to render its plates unserviceable, and so experimental work was carried on until plates of surprising thinness and lightness were put into regular service with satisfactory results. The makers credit the success of their thin plates very largely to the construction of the grid, which consists of a rectangular framework divided into sections by a number of vertical bars, of the full thickness of the plate, and a double lattice-work of much lighter bars, dividing up the plate into diamond-shaped spaces. These diamond lattices form the two surfaces of the plate, and between them, and flush with their faces, the active material is pasted in. The widest space in a diamond opening on one side of the plate is opposite the crossing point of two bars on the opposite side, so that notwithstanding the large open spaces, the paste is well supported. The grids, cast under pressure, are of lead alloyed with a hardening ingredient, and of course each plate is a single piece; its resistance to bending stresses is surprising, considering the material of which is it made.



PHILADELPHIA DIAMOND GRID

The Philadelphia thin plate has been so developed that it now is possible to put 17 plates into the space occupied by 11 thick plates, with an increase in ampere-hour capacity of a fraction more than 45 per cent. and, at the same time, a slight reduction of weight. To give a concrete example, a car equipped with a thick plate battery of 11-plate cells with a capacity of 140 ampere-hours can have a thin-plate battery of 17 plates per cell installed in the same space, with an increase in capacity to 204 ampere-hours and no weight increase—or, of course, the same capacity could be obtained in a smaller space and with correspondingly less weight.

Thin plates are apt to suffer more from handling than from actual service in the cells, and for this reason it is desirable that they should be undisturbed. To this end the spaces under the plates in the bottoms of the jars left for the accommodation of the active material as it falls from the plates are increased when thin plates are employed; in the case of the Philadelphia thin plate battery the ribs which hold the plates from the bottoms of the jars are 2¼ inches high, and the space is sufficient to hold all the active material in the plates. This is equivalent to saying that the cells never need washing out, because the life of the battery ends when all the active material—or nearly all—has left the plates. This obviates the necessity for removing the elements, under ordinary conditions, during the life of the battery.

One of the advantages of the thin plate is that the large surface of active material exposed to the action of the acid gives a high voltage even when the ampere draw on the battery is heavy—the condition under which voltage, which largely governs vehicle speed, is prone to drop off seriously.

The thin plate Exide battery is made up with grids that are of standard Exide design, but reduced in thickness to 3-16 of an inch for the positive plates, the negative plates being 5-32 of an inch thick. The Exide positive grids are divided vertically by thick bars and the vertical divisions are divided by a large number of small crossbars running at right angles to the heavy vertical bars and forming a double network between which the active material is securely locked, while a very large proportion of its surface is exposed. The grid is of what is known as the Bradbury-Stone type, and has been developed from a crude beginning to its present perfected form by a series of experiments that have served to bring out the best proportions for plates of various thicknesses as well as the best lead alloys for the purpose.

It is rather curious, and not a little interesting, that the Exide people lay a great

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deal of stress upon a factor that would seem to have little or no bearing on the performance of a battery. When the plates of a battery are assembled it is necessary to separate them from actual contact, but still permit the electrolyte to circulate. To this end there are two separators between each pair of plates, a perforated sheet of hard rubber next to the positive plate and a sheet of thin wood next to the negative plate; the perforations in the rubber and the porosity of the wood permit the acid to work around. Early in the business it was found that peculiar chemical action was taking place apparently without any cause that could be traced. For a long time it was a baffling mystery, and no end of trouble was occasioned until it was discovered that certain chemical substances natural to the wood of which the separators were made were at the bottom of the difficulty. Immediately steps were taken to correct this, and the result is a chemical treatment for the wood separators that has made a vast difference in the performance of the plates and has removed the cause of many troubles that once were incomprehensible. Treated wood separators now are in general use.

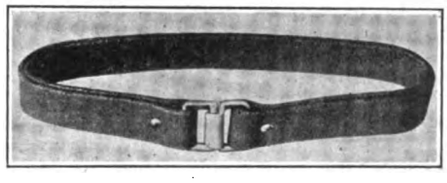
While the battery makers are responsible for a very large part of the vast improvement that has taken place in electric vehicles in the matter of radius of action and power, they cannot take all the credit, for every bit of efficiency that is added to the electric motor, every particle of friction that is eliminated from the mechanism and every economy worked out in the controlling connections reacts directly upon the battery, reducing the demands made upon it and so making a given output of current go just so much further. It is a fact that some of the early motors were absolutely voracious for current, and it is equally true that the gearing of 10 or 15 years ago was enormously less efficient than that of today, all of which meant that there was extra work to be done and that the battery must supply the current to do that work. So the early batteries had a good deal to contend with, besides their own frailties and shortcomings, which certainly were serious enough. But this in no wise detracts from the tremendous advances that have been made in storage batteries, or accumulators, as they call them abroad; and the fact that the present day storage battery is merely the storage battery of many years ago plus refinement of detail, makes the accomplishment all the more remarkable. And notwithstanding all that has been accomplished, it is safe to believe that even yet finality is a long way off.

When Differential Should Be Considered.

When ascertaining the gear ratio of a car on any of the speeds, by jacking up and turning one of the rear wheels and noting the revolutions of the crank shaft of the motor, it should be remembered that the wheel should be turned two revolutions for every one that is counted. This is necessitated by the action of the differential, which serves as a two to one reducing gear between the wheel and the propeller shaft when a single wheel is turned.

Rebound Straps of Woven Fiber.

To devices designed for the purpose of rendering motor car travel more pleasurable by eliminating or subduing the greater part of the up and down motion of the body by checking the rebound of the springs, there has been added another which is styled "Gilmer rebound strap" and is manufactured by the L. H. Gilmer Co., of Philadelphia, Pa., and if not new in purpose, it is new in design and particularly in materials. Like the majority of check straps now on the market, the Gilmer straps are intended to pass around any convenient portion of the car frame, such as a cross member, and also around the rear axle of the car, so as to limit the relative motion of the two connected parts. As shown in the picture, the strap is composed of an endless belt folded flat upon itself and into the looped ends of which drop-forged component parts of the joining buckle have been inserted and retained



GILMER REBOUND STRAP

in place by rivets. The belting itself is woven by a patented process from long fiber cotton, in such a manner as to be seamless and jointless. The tensile strength of the woven straps, it is claimed, is far greater than that of leather straps of the same dimensions. Incidentally, it is pointed out, the Gilmer straps are not subject to stretching and consequent deterioration when under the influence of climatic conditions or when soaked with oil or mud.

Convict Labor that Saves Much Money.

Although it may generally be known that convict labor is employed to a considerable extent in building and maintaining state roads, it is doubtful if there are many who use the roads who appreciate the really tremendous amounts which are saved by employing offenders against the laws of the country for this purpose. In the state of Colorado, for instance, more than $75,000 was saved in a single year, and in the state of Washington by the use of 25,075 days of convict labor a saving of $395 a day has been realized. Incidentally, it is probable that if convicts had not been used for this purpose motorists still would be bumping over mediocre highways. In Montana, 20 per cent. of the cost of road construction has been saved, while in New York and Georgia, where convict labor has been employed for several years, savings have been approximately as great. Appreciating the advantages of putting their convicts to a really useful purpose, Florida, Nevada, North Carolina, Virginia and Tennessee are making considerable savings, and the Michigan legislature recently has passed a law providing that convicts may be employed in road work.

Ingenious British Tank Gauge Evolved.

An English gasolene tank gauge that just has been brought out is decidedly ingenious in its method of adjustment, which permits readings in gallons, no matter what may be the size or the shape of the tank, and no matter how irregular the shape may be. A needle moving over a circular dial is actuated by a float made to turn on its axis, as it rises and falls in a tube, by helical grooves in the tube, the float having projections which engage the grooves; the needle spindle is square and passes through a square hole in the float, so that the float slides on the spindle, but the two turn together. The figures on the dial are printed on movable tabs held under a ring. The gauge is inserted in the empty tank and the tab marked O brought directly under the needle. Half a gallon of gasolene is poured in and the ½-gallon tab brought under the new position of the needle, and so on, progressing by half gallons till the tank is filled and the instrument calibrated. By screwing on the glass cover the tabs are locked in place.

"Holding Compression" not What it Means

It is not uncommon to hear of motors that have "held their compression" for prodigious periods and started on the spark at the end of the specified time, the proof of the retained compression being the fact that the charge was fired. As a matter of fact, the firing of the charge does not necessarily indicate that compression was maintained, because if the mixture in the cylinder contained the proper proportion of gasolene vapor and air it would be ignited by the spark whether under compression or not, and might or might not have sufficient energy to start the motor. Therefore the length of time that elapses between the stopping of a motor and its starting on the spark is no indication whatever of the length of time it requires for the compressed mixture in the cylinders to get down to atmospheric pressure through slow leakage.

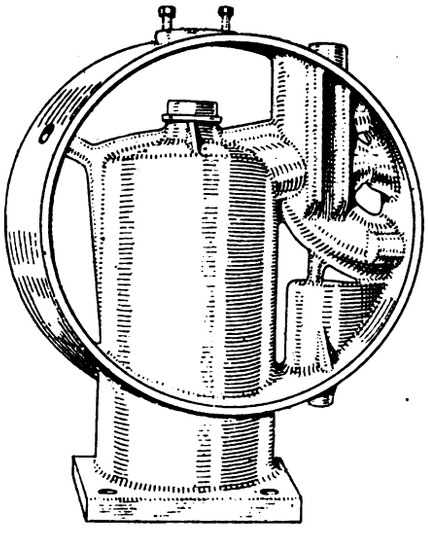
Adding Insult to Injury in England.

The purchase of gasolene—i. e., petrol—in England entails not only the payment of a big, husky price for the liquid, but also a deposit of 50 cents for each two-gallon tin, if the "spirit" is taken away in the original containers. The deposit is refunded upon the return of the tins, whether they are turned in at the point of purchase or at some other depot where the same brand is sold; but it must be rather depressing to buy, say, 20 gallons of gasolene and pay $6 or $7 for it and then hand out an extra $5 as collateral for the cans.

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Water Jackets of Unusual Dimensions.

Although but few manufacturers of gasolene motors agree as to the exact dimensions of the water jacket for a given size motor and variations in the thickness of the surrounding wall of cooling water are therefore much in evidence, it is but rarely that a manufacturer departs so far from the well beaten paths as to produce a motor with cylinder jackets of such abnormal capacity as that shown in the accompanying sketch. The jacket takes the form of a longitudinal cylinder of approximately twice the diameter of the engine cylinder, the edges of both ends being machined so that a perfect fit can be maintained either with the jacket of the next adjoining cylinder or with the plate which serves as a cover, as the case may be. The valve pockets, valve guides and ports as well as the passage which leads to the top of the cylinder and serves as a relief port or priming port, are housed within the water jacket, being cast integral with the cylinder. The

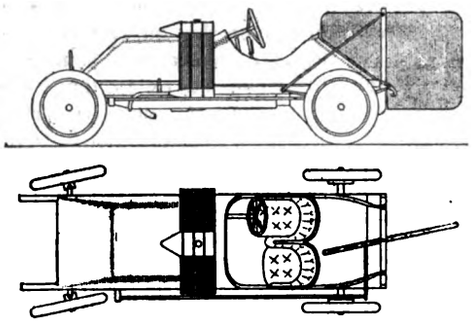


VAUCHET JACKET CONSTRUCTION

motor is the product of the Bauchet Motor Co., of France, and is used on agricultural motors and road tractors, where weight reduction is not of prime importance, while the presence of a liberal amount of water always is advisable. It would appear that the design should greatly facilitate coring operations as well as the removal of scale or furring; possibly something can be said in its favor on the score of obviating the stresses due to unequal expansion of the cylinder and valve pockets, for certainly, with the design, equal cooling such as is not often met with in ordinary practice must prevail.

"Balanced Rudder" to Prevent Skidding.

Although new applications of old devices are not at all uncommon, the application of such a time honored device as a rudder for a service which is absolutely foreign to that for which it has been used since time immemorial scarcely can fail to attract attention. The "rudder" in question is shown in the pictures and is attached to the rear end of a French racing car of Laurin-Klement make. Although attached directly to the steering mechanism so that it moves in unison with the steering wheels, the "rudder" has not to do with directing the car, for its steering action is directly opposed to the action of the wheels. The device is intended to prevent skidding of the rear wheels when the car is driven around bends at a high rate of speed, and this object is accomplished by presenting a large surface to the wind so that the force of the latter opposes the centrifugal force which tends to cause the rear portion of the car to swerve from the curvilinear path. Naturally, the sharper the curve the greater is the surface which is presented,



LAURIN-KLEMENT "RUDDER"

and similarly, the higher the rate of travel the greater is the wind pressure on the "rudder." A novel feature of the device is that in order to relieve the steering gear of the greater part of the pressure caused by the action of the wind on the large surface, the "rudder" is partially "balanced." That is to say, it is swung from a nearly centrally placed pivot so that the wind pressure on the forward portion nearly balances the pressure of the rearward portion.

"Manicured" Pistons to Prevent Smoke.

In efforts to reduce to the minimum smoking from the exhaust, it is fairly common practice where splash oiling prevails to lower the level of the oil in the base, and in not a few cases this results in stinting the pistons and bearings. The smoking is caused naturally by the oil working past the pistons and burning. If the top edge of each piston is neatly rounded off with a fine file and the lower edge left sharp, the oil will be prevented from working past the piston, for the top edge will get but little "hold" on the film, while the lower edge will scrape the oil from the cylinder wall and return it to the base.

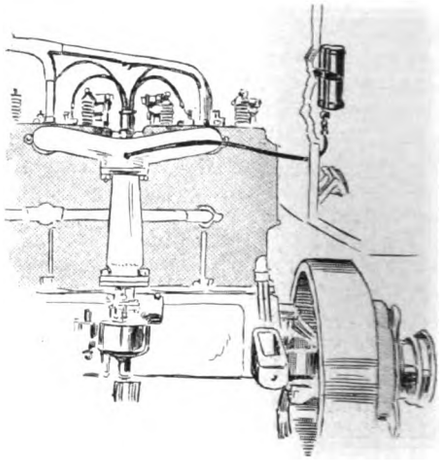
Worn Piston Rings that Cause Carbon.

Excessive carbonization in any one single cylinder generally can be attributed to worn and consequently leaky piston rings, which allow of too free flow of the lubricating oil from the crankcase past the rings to the combustion chamber. Obviously, the remedy consists in fitting new rings.

Dash Primer of Simple Design.

Recognition of the undoubted advantages that accrue from an intimate mixing together of gasolene and air before they are drawn into the motor cylinders has resulted in the production of a number of devices designed to break up liquid globules and so improve the quality of the gas, while some of these devices are more or less complex, others are simple in construction and in operation; to the latter class belongs the National compound mixer and primer, made by the National Mfg. Co., of Kalamazoo, Mich.

The accompanying illustration shows clearly the instrument installed on the dashboard, and it also gives an idea of its simplicity; it consists of two small metal cylinders mounted side by side and connected by a small pipe in which is a stopcock. One of the cylinders is a mixing valve and the other a primer, for the device serves also to prime the motor for starting. A single copper tube runs to the intake pipe above the carburetter. Through the mixer air is admitted to the intake pipe



NATIONAL COMPOUND PRIMER

for the purpose of breaking up the gasolene particles, the quantity of extra air so admitted being regulated, while the motor is running, by means of a cock at the bottom of the mixer. Gasolene is carried in the priming compartment, and when the motor is to be primed the cock between the two little cylinders is opened for a few seconds, which admits gasolene to the mixing valve, whence it is drawn, together with air, to form a rich mixture, when the motor is cranked. The priming mixture is drawn through the intake manifold to all cylinders, so that starting is facilitated—an arrangement that is particularly adapted to motors having no priming cocks. The priming feature is useful also for cleaning the cylinders.

To Facilitate Enlargement of Holes.

Where a small hole in a plank is to be enlarged with an auger bit, the operation can be facilitated if a disk of wood of the same diameter as the smaller hole is placed over the spur of the larger auger.

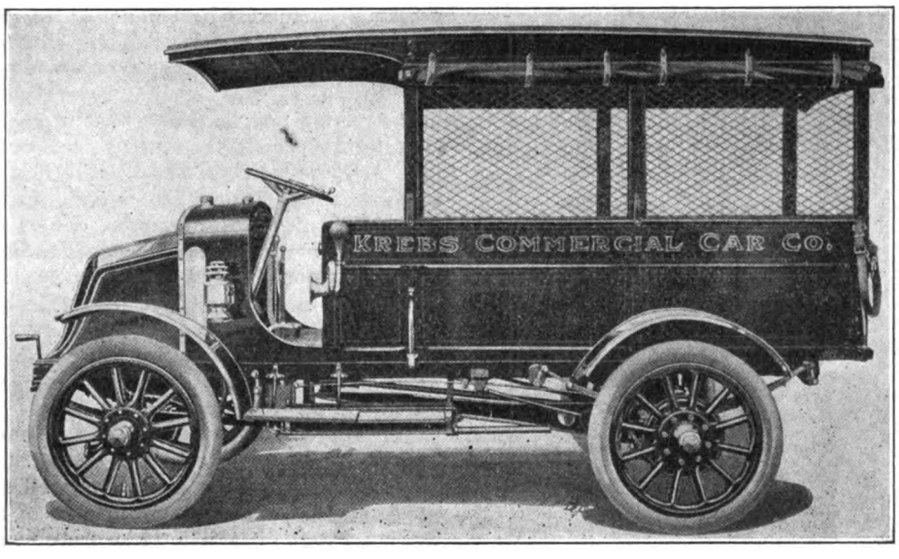
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KREBS LIGHT DELIVERY APPEARS

Company Has Former Elmore Men, Motor Has Former Elmore Features—Car Designed for Light Service.

That there is a practically unlimited field for the light motor driven commercial vehicle almost daily is being brought home with greater force. Long hauls necessitate the heavier types of vehicles which at a single load can transport a sufficient quantity of merchandise to reduce the number of trips to the minimum and therefore reduce the ultimate cost of transportation to the lowest possible ebb. But for comparatively short hauls, as, for instance, in large cities where frequent stops are necessary, or on interurban routes, it is coming to be generally realized that for greatest efficiency the better plan is to employ two or more light vehicles instead of using one heavy vehicle and literally loading it down to the gunwales. Another thing, where speed is a consideration, the light motor truck is the vehicle par excellence, for with it merchandise can be distributed over a greater radius than can be covered with horse-drawn vehicles and the speed of the larger and heavier vehicles is reduced in proportion to their rated capacity.

It was by way of filling this demand for a light motor truck which should be capable of fair speed and still have a comparatively large load capacity coupled with such extreme simplicity as to make its operation a matter which requires neither experience nor labor, that the Krebs 1,500-pound delivery wagon was developed. And in the design which has been adopted the manufacturer, the Krebs Commercial Car Co., of Clyde, O., has succeeded by careful forethought in eliminating at least nine of the proverbial ten causes of trouble.



KREBS LIGHT DELIVERY CAR WITH EXPRESS BODY

In the first place, the engine is of the two-cycle type and, inasmuch as the Krebs company includes among its incorporators such well-known men as Louis Krebs, for whom the company is named, Frank Bachle and B. A. and L. B. Becker, who for a number of years controlled the destiny of the Elmore Mfg. Co. and built it up to be what it was, it is not unnatural that the motor should exhibit many of the features which served to establish the Elmore reputation for reliability and dependability.

The motor is composed of two upright cylinders, the bore and stroke of which —4½ and 5 inches, respectively—are such as to permit the rating of 18 horsepower easily to be obtained. It is placed under a hood at the front, where it is perfectly accessible and from whence it can be taken when necessary simply by removing eight bolts, four from the front cross member of the frame and four from the engine hanger. Ignition is by Bosch high tension magneto and cooling is effected by the thermo-siphonic system. A Stromberg carburetter is employed.

Unusual for a car of such light weight is the provision of a governor which limits the speed of the vehicle to a maximum of 20 miles an hour. The governor, which is of the centrifugal type, acts directly on the throttle and limits the rate of revolution of the motor. It is unique in that it is controllable from the steering column, at the top of which a lever, which also serves to control the spark advance, is provided for the purpose. By suitably setting the lever, the vehicle can be made to maintain any desired speed from 10 to 20 miles an hour.

Control is through the intermediary of a Brown-Lipe three-speed forward and reverse selectively operated gearset and a self-contained cone clutch. The control levers are mounted in the center and the steering wheel is arranged for left-hand drive. Semi-elliptic springs are provided all around, the front pair being 40 and the rear 50 inches long. Double internal expanding brakes positioned on the rear wheels are used.

Two models are produced, though both are similar in all details save the final drive. Model A, which is chain driven, is fitted with a solid rectangular rear axle with the differential on a jack shaft, and roller chain drive. Power is transmitted from the gearset of Model B to the rear wheels through the intermediary of the orthodox propeller shaft provided with two Spicer universal joints and a full floating rear axle. In both models the wheelbase is 100 inches and the wheels are 34 inches in diameter. Solid tires, 34 x 3 inches, with S. A. E. standard bands, are provided on the chain driven model; demountable rims carrying 34 x 4 tires are fitted to the shaft driven model. Equipment includes the customary tools and tool kit, jack, two side oil lamps and a tail lamp. The chassis price for either shaft or chain driven model is $1,375. Model A, fitted with a standard open express body, lists at $1,510, and Model B, fitted with a standing roof screened express body, sells for $1,550.

How Small Parts May Be Brazed.

Though instructions may read smoothly and sound as if they might be easily followed, it is by no means an easy matter for an unskilled amateur to do a good job of brazing at the first attempt, except through one of those accidents that sometimes happen. In case of necessity it can be done, however, with patience and practice and perhaps a few preliminary failures. The first requisite is plenty of heat from some sort of a clean fire; the second is a good fit between the parts to be joined and absolute cleanliness of the adjoining surfaces; and the third is "spelter" and common borax. The whole story is to put the parts together and hold them securely while heating, to heat them to a light red and apply several small doses of borax with a spoon made of a piece of flattened copper wire, and to follow this with an application of spelter, which should melt and run into the joint. Incidentally, it is impossible to make the joint too close; no matter how well it is fitted or how tightly it is held the spelter will run in, and the less room there is for it the better the joint will be. The heat is best applied with a gas blow-pipe or gasolene blow-torch, and if the work is laid in the angle of a couple of fire bricks the heat will be concentrated and economized—in fact, unless the torch or blow-pipe is quite large or the work small it will be difficult, if not impossible, to braze without some such arrangement.

When Speed Over Bumps May be Helpful.

Driving over rough roads at the slowest possible rate of speed is not always the best plan. It often happens that a very slow rate will result in the setting up of much more severe vibration than a slightly higher speed, which would tend to interrupt the swing of the body on the springs.

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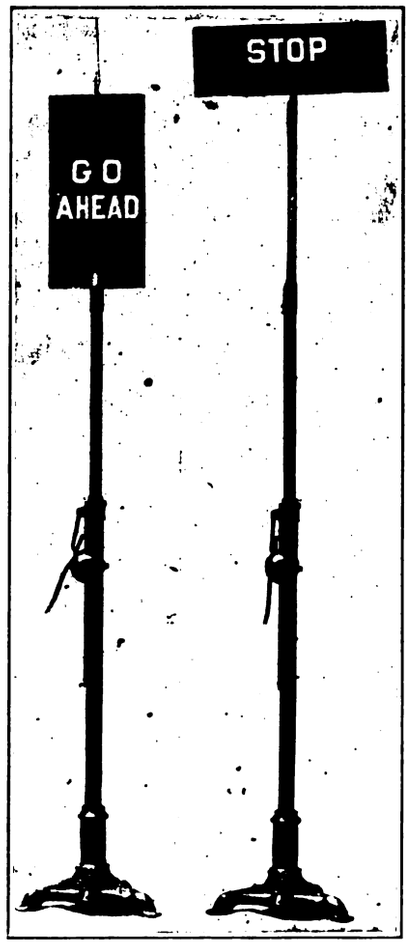
TO EASE TRAFFIC SQUAD BURDENS

Invention That Permits Brainwork and Therefore Reduces Manual Labor—New York Police Make Tests.

While a great deal more interest has been evinced in the development of street signalling devices in European cities, where they are used to a greater or lesser extent for the regulation of vehicular traffic than is the case in America, where they have not been in regular service at all, it is doubtful if anything of the sort in use over the sea combines the simplicity and effectiveness of the Herz-von Rust traffic signal invented by Lehman Weil, of 172 East End avenue, New York. The new signal has not been put into every-day service as yet, though it has been given a thoroughly practical try-out by Capt. O'Brien, of the New York traffic squad, and it is known that the captain and his lieutenant are convinced of the practical utility of the device, though an official report to that effect has yet to be made public.

The Herz-von Rust semaphore was born of an actual necessity, and the real need for it is evinced at every crowded street intersection where a harrassed traffic policeman converts himself into a human windmill in imitation of a semaphore, and punctuates his contortions with more or less effective tootings on a whistle, all for the purpose of shooing several lines of impatient drivers of wagons and motor vehicles on their several ways without conflict or confusion. As the French police have succeeded in doing this work with only a tithe of the sacrifice of dignity that marks the American plan—to say nothing of the saving in human endurance—the New York traffic squad felt encouraged to make a service test of the Herz-von Rust invention, and there is a possibility that, as a consequence, it or some similar device may get a job "on the force."

The simplicity of the signal is such that the traffic policeman's task will be reduced to labors akin in simplicity to the pumping of water from the village well, as far as the physical part of it is concerned. The device embraces a standard some four feet in height, the foot of which when in regular service will be imbedded in the asphalt to give it stability. Above the standard rises a rod, the top of which is approximately eight feet from the pavement and is surmounted by two signs placed one above the other and at right angles to each other, the plan view having a cross shape. One of the signs is painted a vivid red and bears the imperative command "Stop" on both sides. The other is decorated in green and lettered "Go slow," likewise on both sides. The upright carrying the signs is caused to rotate by a lever of the pump-handle variety placed within easy reach of the "cop" in charge; depressing the lever gives the elevated "instructions" one-quarter turn at each motion, at the same time ringing a gong—the coming successor of the aforementioned whistle. Obviously, when the order "Stop" blazes two ways at once on one street, the soothing "Go slow" will lift the curse of inactivity from the waiting vehicles on the other street, the gong calling the attention of brewery



VON RUST TRAFFIC SEMAPHORE

wagon drivers and other somnambulists to the changes.

"Trespassing" Passenger Has no Redress.

Unless a passenger in an automobile is paying a fare to the owner of the car or is riding at the expressed invitation of the owner, he has no redress for injuries sustained through any cause, according to a case which was carried up and just has been decided in the King's Bench Division of the court of England. Which is to say, if a chauffeur extends an invitation to ride and the passenger is injured, the latter has no claim against the car's owner, even though the chauffeur at the time be upon business of his employer. The case in question was entitled Haughton vs. Pilkington, and though the impression might be gained that the passenger would have no redress, the lower court, in which the case was tried, believed otherwise and awarded Haughton damages of £20, or about $100. The higher court, in rendering its decision, however, divided passengers into three classes—those paying a fare, those riding by invitation under circumstances of favor, and those who are mere trespassers—and reversed the decision.

Making Plain Two Common Terms.

In these days of enlightenment, when even the most erudite, and consequently recondite, words and phrases in the automobile engineer's vocabulary roll glibly off the tongue of the average individual car owner and are understood, or, rather, nearly understood in their real meaning, there still is one term that generally proves a snag over which not a few stumble. The term is "thermal efficiency." In the fewest possible number of words the phrase means "ratio of output to input in terms of heat units." That is to say, gasolene, or kerosene, or alcohol, or any other fuel contains a certain number of heat units, or, as they generally are known, British Thermal Units. Unfortunately, however, owing to the heat losses which cannot be prevented in converting heat into power, it is impossible to utilize all the heat value of the fuel. Consequently, considerably more actual heat value must be used up than is returned in the form of power. The thermal efficiency of the engine depends upon its ability to convert the greatest possible amount of heat into power with the least loss. Similarly, mechanical efficiency represents the ratio of indicated horsepower to brake horsepower.

Few Contest Recommendations Made.

That those who have to do with the manufacture of motor cars are pretty well satisfied with the rules and regulations of the Contest Board of the American Automobile Association amply was shown by the remarkably few suggestions for changes which were made at the regular mid-Summer meeting of the Manufacturers' Contest Association, which was held Thursday last, 15th inst., at the Hotel Pontchartrain, in Detroit. In answer to a series of questions which were sent out to 130 manufacturers with a view to ascertaining their opinions with regard to contests and the character of contests, all were agreed on the good that the proper supervision of sporting events has done, and that contests should be regulated as has been done in the past. Sentiment with regard to stock and non-stock races was about equally divided.

Apperson Adds Illuminating House Organ.

Following the excellent example of a number of other manufacturers who are prominent in the production of motor cars, the Apperson Bros. Automobile Co., of Kokomo, Ind., has commenced the publication of a house organ which bears the title "The Apperson Way." Naturally the things that pertain to the Apperson car are given first consideration, and the matter is handled in a way that is interesting.

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MINNEAPOLIS TOURISTS HOME AGAIN

Only One Survives 1,000-Mile Jaunt Into Canada with Clean Slate—Roadster Class Scores Debated.

With but a single contender,' of the 11 who left Minneapolis on Thursday, August 8th, to travel to Winnipeg, to finish with a clean slate, the fourth annual endurance run of the Minnesota State Automobile Association ended in the Twin Cities Thursday last, 15th inst. Strangely enough, the winner, Bohn Fawkes, who completed the more than 1,000-mile jaunt into Canada and back without even changing the air in a single tire, piloted the same Marmon car with which he performed a similar feat in last year's tour. The twice winning contestant therefore permanently annexes the Journal trophy, offered by the Minneapolis Evening Journal under a deed of gift which makes the trophy the permanent property of the contestant who wins it twice in succession.

The winner in the runabout division competing for the Minneapolis News Cup has not yet been determined, since the scores of the two contestants who made the best showing, Clarence Munzer (Hupmobile) and H. W. Soules (Studebaker "20"), were tied at 21 points, and the scores of both are under discussion, and probably will be settled by the A. A. A. contest board.

After having spent the entire day Sunday, August 11, at Winnipeg, in putting things "to rights" after the hard three-days' run, the tourists covered 160 miles to Grand Forks on Monday, 84 miles of which was through the State of North Dakota and over roads which, if not 100 per cent. smooth, were not particularly rough. So far in advance of the caravan did the confetti car travel that at one point the wind and dust acted to eliminate all traces of the road-marking paper bits and the pacemaker, and most of the contestants took a wrong fork in the road and traveled 20 miles out of the beaten trail before the mistake was noticed.

Although all were late in checking in, none was penalized because of the character of the mistake. However, penalties were meted out to those who "fell by the wayside" and resorted to the use of tools. A. Zeckman received 87 points for as many minutes' work, when he stripped a pin on the steering gear of his Cadillac and landed in a ditch. Later he received 100 more because of a broken spring which had been weakened in the previous accident. The Warren car driven by Henry Rockleman was penalized 16 points for time lost in making tire repairs. George Murphy annexed 50 demerits for the same cause and W. H. Soules increased his score by 12 points when his fuel pipe became disarranged. Fox, driver of a Paige-Detroit car, received 99 points for work done on his motor, and P. L. Palmer (Cutting) withdrew with a broken rear axle.

By Tuesday evening the tourists had put 120 miles between them and Grand Forks and encamped at the "little twin cities," Wahpeton and Breckenridge. The "going" throughout the day had been fair, but penalties in plenty were collected. Three times Munzer stopped to give his Hupmobile water at 2 points a stop, and similar trouble caused H. W. Fawkes (Reo) to collect 12 points; and a stop long enough to fix a bothersome leak in the cooling system ran his day's penalization up to 30 points. Zeckman in his Cadillac received another 75 demerits, when he stopped to replace the spring which had been broken on the day previous, and Rockleman collected 200 points for work done on the motor of his Warren. George Murphy collected another 14 points for tire trouble on his Mitchell.

Annandale, 140 miles away, was reached the following evening, the scores of four of the contestants having been increased during the day. Murphy (Mitchell) collected 50 points for motor work, Rockleman got 212 for a similar cause, and H. W. Fawkes (Reo) and Clarence Munzer (Hupmobile) added 28 and 8 points to their respective scores by taking on water outside of a control. From Annandale but 64 miles were covered on the last day of the tour, so that the tourists arrived in Minneapolis a little after noon. The final scores are:

Touring car class—Bohn Fawkes (Marmon), 0; Paul Carpenter (McFarlan), 5; George Murphy (Mitchell), 127; Edward Fox (Paige-Detroit), 265; Harry Rockleman (Warren), 429. Runabout class—A. Zeckman (Cadillac), 261; P. L. Palmer (Cutting), out; H. W. Fawkes (Reo), 64; Clarence Munzer (Hupmobile), 21; H. W. Soules (Studebaker "20"), 21.

Flanders Pathfinder Nearing New Orleans.

Hub-deep mud, which was encountered soon after the Flanders electric coupe, which is mapping out the course for the coming National Reliability tour, had left Corinth, Miss., on Wednesday last, 14th inst., so retarded the progress of the car that several times the route had to be changed and long detours made, so that the 100 intervening miles between Corinth and Memphis were not completed until noon on Friday. The stern of the little electric was turned to Memphis on Saturday morning, and two more days of very bad going carried the tourists only as far as Lula, Miss., 75 miles away, which place was reached on Sunday. Good weather, which also meant fair roads, enabled the car to cover the same mileage on Monday, and Cruger was reached that evening. Another 50 miles were reeled off on Tuesday, and brought the tourists to Canton. In round numbers, 250 miles still remain to be covered from Canton to New Orleans, and it is expected that the pathfinders will emerge from the car at the latter city in their dapper white suits ere high noon on Saturday next, 24th inst.

BURMAN STARS AT ALBANY MEET

Accounts for All But Two Events and Takes Brassard Heats, of Course—Lesser Lights Scintillate.

All save two of the half dozen Moross events which were run on the Abbey halfhile track at Albany, N. Y., Saturday list, 17th inst., went the way that Moross events generally do—Burman way. The "big" event of the day, the three-mile free-for-all handicap, however, was just missed by Burman (Ohio), who started from scratch and crossed the tap a few fractions of a second later than Harry Kyle (White), who had a 10-second handicap. Kyle's time was 4:45⅗. The other event which Burman missed—another three-mile free-for-all handicap, open only to amateur drivers—went to Walter Dodds, who drove a Stutz car and won in 5:40 from scratch. Burman "took" two Class E events, and both heats which were run for the Remy Brassard and trophy. He also drove a single exhibition mile in the Benz, in 1:12⅘. The summary:

Three miles, free-for-all handicap—Won by Walter S. Dodds (Stutz) from scratch; G. D. Earle (Jackson), 100 yds. Time, 5:40.

Three miles, Class E, for cars with displacements of under 600 inches—Won by Robert Burman (Cutting); second, Harry Kyle (White). Time, 4:09⅗.

Three miles, free-for-all, for the Remy Brassard and trophy. First heat—Won by Robert Burman (Ohio); second, Harry Kyle (White); third, H. Hickman (Mercedes); fourth, Joe Grennon (Benz). Time, 4:20. Second heat—Won by Robert Burman (Ohio); second, H. Hickman (Mercedes); third, Harry Kyle (White); fourth, Joe Grennon (Benz). Time, 4:18⅗.

Three miles, Class E, for cars with displacements of under 600 inches—Won by Robert Burman (Cutting); second, Harry Kyle (White). Time, 4:07⅗.

One miel time trial—Robert Burman (Benz). Time, 1:12⅘.

Three miles, free-for-all handicap—Won by Harry Kyle (White), 10 seconds; second, Robert Burman (Ohio), scratch; third, Joe Grennon (Benz), 20 seconds. Time, 4:45⅗.

Moross Meet at Brighton Likely.

Unless a hitch develops, which is unlikely, Earnie Moross, with his troupe of stars, again will visit the seaside track at Brighton Beach, Brooklyn, N. Y. Although formal application has not yet been made for the sanction, it is likely that it will be forthcoming within the next few days. According to tentative plans, Moross proposes to stage eight events on Labor Day, seven of which will be open competitions and the eighth to be a time trial by Burman, in which he will attempt to lower the record which he hung up the last time he visited that track last year.

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PRACTICE BEGINS ON ELGIN COURSE

Tuning-up Process Commenced by Several Drivers on Unfinished Road—Famous Names on Entry List.

Although the final touches have not yet been put on the 8¼ miles of dirt road over which the five speed events which go to make up the program for the coming race meet at Elgin, Ill., are to be run, on the concluding two days of the month, Friday and Saturday, Aug. 30th and 31st, practice over the course already has started, with three "early birds" engaged in tuning up their mounts. Tetzlaff, who will drive a Fiat in both the "big" events which will be staged on the second day, and Harry Endicott, who will pilot the Mason entry in the baby car event, which is an added number, both tried out their mounts on the course on Monday last; Mulford, who will drive a Knox, joined them on Wednesday.

To date, with the entry lists still open and certain to remain open until the evening of Saturday next, 24th inst., eighteen contenders have entered one or more of the five events which will be run, and among them are not a few of those whose names are not unknown to fame. Len Zengle, who won the Elgin national stock chassis road race last year at the wheel of a National, will this year pilot a Stutz; Bruce-Brown will appear in the Fiat in which he made such a good showing in the French Grand Prix; "Teddy" Tetzlaff, who won the last Santa Monica race, will drive a Fiat; Billy Knipper will handle the second Stutz car which is entered in the race for the Elgin trophy, and Hughie Hughes, as usual, will be at the wheel of one of the Mercers; the pilot for the second Mercer entry has not as yet been named. The latest entry is George Clark, who will drive the Mercedes car with which he made such a fine showing at the recent Galveston races, when he crossed the tape twice a good second to Disbrow.

Not a few of the contenders in the 254-mile race for the Elgin trophy also are booked to compete in the 306-mile free-for-all which will be run simultaneously with the shorter event. The list has been augmented by the addition of Louis Bergdoll's name. Bergdoll won the Fairmount Park race last year, and will drive a Benz in the longer of the last day's contests.

The entry lists for the three shorter events which will be run on the first day boast of but two names each. In the Class C event for cars with displacements of 231-300 inches, for which the Aurora trophy is offered and which goes for 152.5 miles, a Falcar and an Ohio car are entered, but who will pilot either entry has not as yet been disclosed. Merz and Gil Anderson each will drive Stutz cars in the Class C 203-mile race, which is open to cars with displacements of 301-450 inches, and W. G. Wordingham and Harry Endicott will pilot a Herreshoff and a Mason, respectively, in the lately added "baby" car event, which is open to cars with displacements of less than 231 inches and will go for 152½ miles. Endicott was to have been in on the "bigger" events of the second day with a Schacht car, but the recent action of the Contest Board of the American Automobile Association disqualifying Schacht cars and preventing their further participation in sanctioned events until the end of the year made a change of mounts necessary. The list of entries is as follows:

Elgin National Trophy, 254 miles—Geo. Clark, Mercedes; Theo. Tetzlaff, Fiat; David L. Bruce-Brown, Fiat; Ralph Mulford, Knox; Len Zengle, Stutz; William Knipper, Stutz; Hughie Hughes, Mercer; ———, Mercer.

Free-for-all, 306 miles—George Clark, Mercedes; Theo. Tetzlaff, Fiat; David L. Bruce-Brown, Fiat; Louis Bergdoll, Benz; Ralph Mulford, Knox; Hughie Hughes, Mercer; ———, Mercer.

Illinois trophy, 203 miles—Chas. Merz, Stutz; Gil Anderson, Stutz.

Aurora trophy, 153 miles—An Ohio and a Fal are entered; drivers' names not given.

Under 231 inches' displacement, 153 miles—W. G. Wordingham, Herreshoff; Wm. Endicott, Mason.

Bolter Returns to Ohio Association.

Although it was more or less confidently expected that, as a result of the turmoil which grew out of the annual meeting of the Ohio State Automobile Association, which occurred in Kenton on May 18th, the formation of another state body, to be styled the Ohio Motor Federation, would evolve, it appears that nothing of the kind will come to pass after all. Having had time to think the matter over and to cool off slightly, at least one of the seceding clubs has regretted of its action. It is the Automobile Club of Jefferson County, which is located at Steubenville. Through its president, H. A. Smith, and its secretary, Roy McClave, the club has sent a communication to the Ohio State Automobile Association stating that a check would be forwarded for the dues of some 41 members whom it wished "fully to protect as members of the Ohio State Automobile Association, as well as of the A. A. A." Whether or not the other bolters will follow suit remains to be seen, though it is strongly intimated that they eventually will re-enter the Ohio state body. As a matter of fact, however, none of the eleven seceding clubs ever really got out of the state association, for the reason that their dues therein were fully paid for the year.

At a meeting which was held in Fort Worth, Tex., and which resulted in the formation of the Studebaker Dealers' Association of Texas, B. C. Nettles, Waco, was elected president. Other officers are: Vice-president, A. P. Mitchell, Fort Worth; secretary-treasurer, H. C. Mosehart, Houston.

TRUCK GUARANTEE FAVORABLY MET

Twenty-two Manufacturers Adopt or Give Consideration to N. A. A. M. Suggestion—Disagree on Time.

The form of motor truck guarantee drawn up by the commercial vehicle section of the National Association of Automobile Manufacturers and recommended by the association at the spring meeting of truck manufacturers in New York for general adoption by manufacturers of trucks, has been given serious consideration, as is indicated by the fact that 22 makers have either adopted it or have signified their intention of doing so, and others are expected to do likewise. The proposed warranty differs from the older form, adopted in 1910, mainly in the form of its wording, apart from the fact that the time of guarantee is cut from one year to 90 days, while restrictions regarding overloading and other forms of unreasonable treatment are strengthened in order to give the manufacturer and dealer fair protection. The only material criticism offered bears on the shortening of the time from one year to 90 days; there is a lack of uniformity among the makers in this respect, the time of the guarantee varying from 90 days to no less than seven years. Apparently, however, the feeling of those who have given long-term guarantees is that if the 90-day clause is satisfactory to a majority of the makers they (the long-time guarantors) will be glad to join in and "make it unanimous."

Truck manufacturers in the South have found the one-year guarantee particularly impracticable because purchasers of trucks, it is said, are in the habit of turning the machines over to negroes or incompetent whites, with the result that the manufacturers are forced to keep the machines in service under extremely unfavorable conditions, to the serious reduction, if not the entire elimination in some cases, of profits.

A number of manufacturers who have not yet signified their intention of adopting the guarantee suggested by the N. A. A. M. commercial vehicle committee have nevertheless commented favorably upon it, and it is anticipated that it will not be long before general adoption follows—a belief which is strengthened by the number of makers who already have taken the step, the favorable comments of others and the almost total lack of unfavorable criticism.

Arizona Adopts Registration Measure.

The first Arizona legislature, which recently closed its sessions, adopted a measure compelling the registration of automobiles and chauffeurs and regulating the operation of cars on public highways. Money realized as a result of the new law will go into the state road fund; the measure goes into effect September 1.

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1,014,533. Spring Wheel. Georg V. Stein, Washington, Ind.., assignor, by direct and mesne assignments, of one-third to Austin F. Cabel, Washington, Ind., and one-third to Harry Weill, Indianapolis, Ind. Filed Mar. 9, 1911. Serial No. 613,220.

A wheel comprising a hub, a rim, arcuate springs connected intermediate their ends to the rim, spreader bars carried by the hub and adjustable toward and from the rim, and links connecting the ends of each spring to one of the spreader bars.

1,014,553. Automobile Top. Claude M. Zellers, St. Louis, Mo. Filed May 2, 1910. Serial No. 558,849.

A bow for automobile tops, comprising a tubular member constructed of separable halves hinged together and means for holding said halves separated at times, which means occupy positions within the bow-members when folded.

1,014,558. Resilient Wheel. Ernest Charles Bass and Edward Stamford Hough, London, England. Filed Dec. 2, 1909. Serial No. 530,940.

In a resilient wheel, a hub, a floating outer rim, an inner rim rigidly attached to the hub, a series of rocking links pivotally connected with one of the rims, a series of levers each fulcruming on a rocking link and elastically connected with the hub, and a series of main links pivoted at one end to the second rim and at the other rim to the said levers.

1,014,562. Automobile Chassis. William H. Bell, New York, N. Y., assignor to Oswald J. Karsch, New York, N. Y. Filed Nov. 2, 1910. Serial No. 590,333.

An automobile chassis, comprising a plurality of rigid side bars; a plurality of carrying wheel axles; a plurality of swing bars pivotally connected with said axles and the ends of said side bars, each of said swing bars connecting one of said axles and that end of one of said side bars which is remote from the axle to which the said swing bar is connected; a plurality of springs interposed between said swing bars and said side bars at near the pivot connection thereof; and riding plates formed on said swing bars at the mid section thereof, and provided with slots formed therein, the curve of said slots being formed from the pivot connection of each of said swing bars and the axle whereupon each is mounted.

1,014,627. Automobile Headlight Turning Device. Raymond G. Gaskill, Port Deposit, Md. Filed Mar. 9, 1911. Serial No. 613,435.

The combination with the channeled side bar of a vehicle frame, said bar being formed with a longitudinally extending slot, of a lamp supporting post mounted to turn on the outer side of said bar and provided with a crank arm extending inwardly through said slot, an actuating rod mounted in the channel of said side bar and effectually concealed thereby, steering mechanism and an operative connection between the steering mechanism and said actuating rod, whereby the latter will be turned upon the actuation of the former.

1,014,644. Resilient Wheel. Robert Elwood Ellis, Riddrie, Glasgow, Scotland. Filed Apr. 29, 1911. Serial No. 624,085.

A resilient wheel comprising, in combination, an inner wheel member or felly, a separable outer rim encircling said wheel member or felly, supporting members on said inner wheel member or felly, supporting members on said outer rim, each of said last mentioned supporting members having a slot open at one side, and a resilient endless band engaging both sets of said supporting members and adapted to be entered laterally into said slots, substantially as described.

1,014,668. Internal Combustion Engine. Samuel Pearson, Kerrville, Tex. Filed Dec. 14, 1910. Serial No. 597,210.

An internal combustion engine, comprising a low pressure cylinder having exhaust ports formed in the side wall thereof near the ends thereof; an exhaust chamber mounted on said cylinder and in communication therewith through said ports; a valve mounted in said chamber arranged to close said ports alternately; a piston mounted in said cylinder adapted to close said ports; a plurality of explosion cylinders connected with said low pressure cylinder to exhaust into said low pressure cylinder and at the opposite ends thereof, said cylinders having exhaust ports disposed in the wall thereof about midway the length thereof; a plurality of pistons, one mounted in each of said explosion cylinders, adapted to close the exhaust ports formed therein; a crank shaft having a plurality of cranks disposed at angles of near 120°; and a plurality of piston rods connecting said cranks and said pistons.

1,014,814. Metallic Tire. Clarence E. Cox, Fairfax, Mo. Filed June 20, 1910. Serial No. 568,026.

A tire including a plurality of metallic sections each having grooves at one edge and inturned tongues at its opposite edge, the tongues and the grooves being formed for interlocking engagement, and beads carried upon the outer faces of the sections and overhanging the grooves to retain the tongues therein.

1,014,816. Radiator for Automobiles and the Like. Alfred Dippert, Detroit, Mich., assignor to Charles W. Dippert, Buffalo, N. Y. Filed Aug. 12, 1910. Serial No. 576,899.

In a radiator, a plurality of superimposed fins formed intermediate their front and rear edges to provide separate superimposed longitudinal passages, the front and rear portions of said fins on opposite sides of the longitudinal passages being formed to provide inner and outer sets of passages and communicating with the first named passages, and a plurality of water pipes intersecting and piercing said passages, the inner ends of the inner and outer sets of passages being contracted so that air currents are forced into and out of the first named passages.

1,014,826. Clutch. Morris B. Ireland, New York, N. Y. Filed Jan. 22, 1909. Serial No. 473,613.

The combination with a driving and a driven shaft, of co-operating clutch members carried by said shaft, one of said clutch members being movably mounted to releasably engage the other member, and means whereby upon a predetermined load the shaft carrying one of said clutch members is permitted to rotate differentially with respect to said clutch member.

1,014,858. Spring Wheel. Robert Stock, New York, N. Y. Filed May 27, 1911. Serial No. 629,769.

A spring wheel comprising a felly, a tire casing arranged around the felly, springs engaging with the inner side of the tire casing, and adjusting devices constructed to draw the casing inwardly and press the springs outwardly or vice versa comprising a follower bearing against the inner ends of said springs and provided with an inwardly projecting screw stem, an adjusting screw journaled on the felly and having an internal screw thread which engages with said stem, and a yoke connected with said casing and having an internally screw threaded opening which engages with an external screw thread on the adjusting screw.

1,014,884. Resilient Wheel. Harry Leap, Camp Meeker, Cal. Filed Nov. 18, 1910. Serial No. 592,973.

The combination in a wheel of a hub having parallel separated flange plates, a resilient rim, flat curved elastic spokes having eyes seated between the flanges, bolts passing through the flanges and eyes, segmental shoes fixed to the outer ends of the spokes and forming approximately continuous seats for the resilient rim, and means for varying the tension of the spokes.

1,014,912. Tread for Pneumatic Tires. Alvin H. Shoemaker, Portland, Ore., assignor, by mesne assignments, to Hurley Hercules Pneumatic Tire Company, Portland, Ore., a Corporation of Oregon. Filed Apr. 8, 1911. Serial No. 619,851.

A pneumatic tire comprising a body portion provided on its outer surface with a peripheral layer of rubber, a plurality of alternate strips of fabric and rubber beyond the layer of rubber on the body portion, each layer of fabric and rubber being crescent shape and arranged perpendicular to and diagonally across the peripheral layer of rubber on the body portion; the outer edges of the crescent shape strips of fabric forming with the alternate strips of rubber a crescent shape tread, and the strips of rubber between the fabric merging into and forming part of the layer of rubber on the body portion, the ends of said strips of rubber being elongated and merging into and forming a part of the side portions of said peripheral layer or rubber on the body portion.

1,014,988. Carburetter. Frank Drew Winkley, Madison, Wis., assignor to Fuller & Johnston Manufacturing Co., Madison, Wis., a Corporation of Wisconsin. Filed Oct. 15, 1910. Serial No. 587,155.

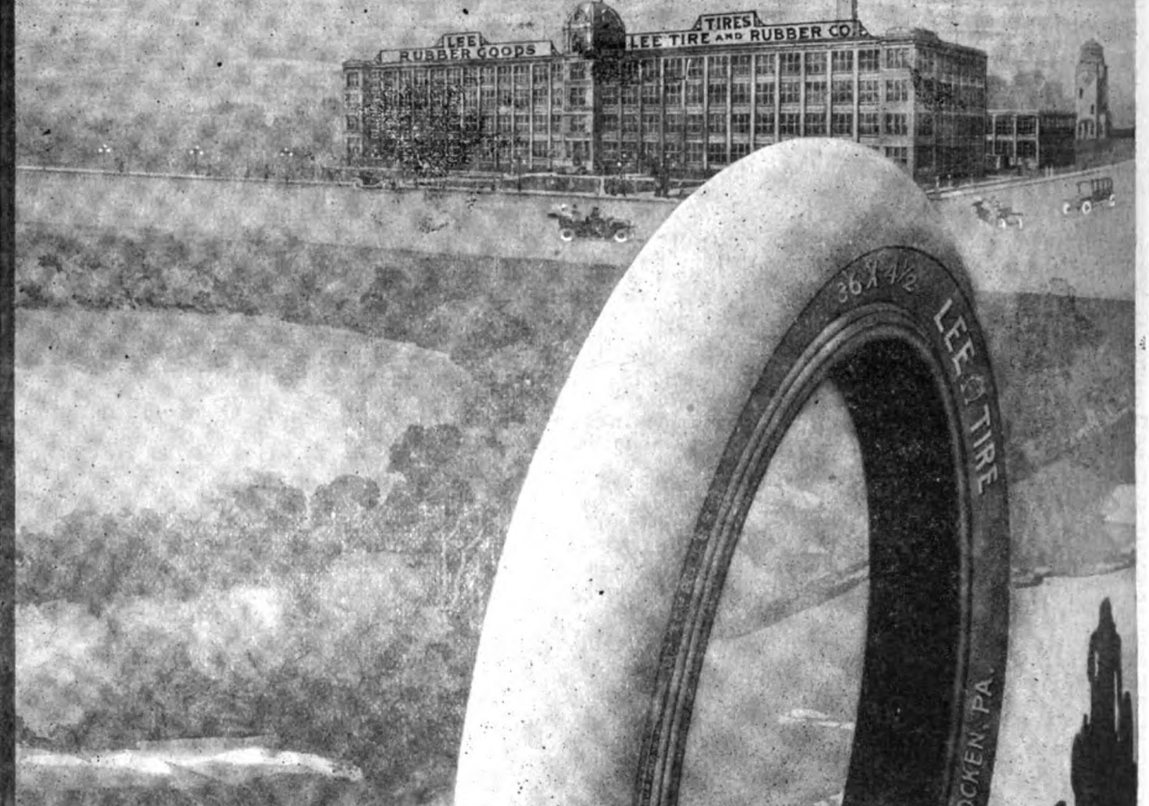
In combination with a carburetter for gas engines, a conductor leading from said carburetter to the combustion space of the engine and formed with a chamber intersecting the conducting passage, and a plug adapted to occupy said chamber and suitably cored to constitute a section of said conducting passage, said plug being removable to heat the same, substantially as described.

1,015,035. Tire for Vehicle Wheels. Benjamin F. Lare, Philadelphia, Pa. Filed Sept. 30, 1910. Serial No. 584,658.

A spring section for a tire consisting of a convolution of spring material having a plurality of surfaces, either surface serving as a tread or rim engaging surface, and one serving as the tread when the other is positioned to engage the rim, off-sets upon opposite sides of each surface, and clamping means adapted to engage the off-set on each side of the surface which is positioned to engage the rim.

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LEE TIRES



Announcing the fact that
Mr. Charles F. U. Kelly and Mr. Harry E. Field
who have organized the firm of
KELLY-FIELD CO.
1737 Broadway, New York City
are now general sales agents
for Lee Tires, Tubes and Tire Accessories

The members of this firm are favorably known to the trade the country over—

Mr. Kelly, the former president and principal organizer of the Kelly-Racine Rubber Co., has been one of the best known tire men ever since bicycle days; being connected earlier with Hodgman Rubber Co. and B. F. Goodrich Co.

Mr. Field, who is at present president of the T. B. Jeffrey Co., of New York, was previously vice-president and general sales manager of the Hartford Rubber Co.

This makes possible greater sales efficiency and more thorough co-operation with the trade. Added to the proved superiority of Lee Tires (due to the use of better materials and improved processes) and the wonderful record made by Lee Puncture-Proof Tires on commercial as well as pleasure vehicles—it makes the Lee proposition one that appeals to the live dealer in every community. Write for our special proposition V.



Smiles at *Miles*

Lee Tire & Rubber Co.
CONSHOHOCKEN, PA.

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Chalmers

"Six" 2,4 or 5 Passenger $2400
"Six" 7 Passenger $2600
"Thirty-Six" $1950
"30" $1600

This monogram on the radiator stands for all you can ask in a motor car



"Thirty-Six" $1950

15 Notable Chalmers Features

Electric Lights *Turkish Cushions* *Nickel Trimmings*
Increased Wheel Base *Eleven-inch Upholstery*
Improved Springs *New Flush-sided Bodies*
Chalmers Self-Starter *Demountable Rims*
Long Stroke Motor *Big Wheels and Tires*
Carburetor Dash Adjustment *Dual Ignition System*
Four-Forward Speed Transmission *Speedometer*

WE announce for 1913, big improvements in Chalmers cars in ***comfort, convenience*** and ***appearance.*** For it is along these lines that we believe the greatest advances in automobile building are to be made.

Few changes have been made in our chasses. The mechanical features of our cars have been right from the beginning. Satisfactory service in the hands of 27,000 owners proves this.

Here, then, are the principal additions and improvements on Chalmers 1913 cars:

Easier Riding Qualities

Luxurious comfort is built into every detail of Chalmers cars. The Turkish cushions, 11 inches thick, are soft as a down pillow. The upholstery is of the overstuffed type. All seats are wide, filled with high grade hair and covered with heavy, soft, pebble-grained leather.

The long wheel base, big wheels and tires, and long elastic springs, make all roads smooth.

More Conveniences for Operator

Electric lighting is regular equipment for 1913 on the "Thirty-Six" and the "Six." Just touch a switch on the dash and you can light at will head, tail and side lights.

And no more cranking. A season's use has proved the Chalmers air pressure starter the simplest and most efficient starting device yet designed.

Conveniently located on the new style Chalmers dash are all controls and indicators. Everything you need for running the car is within easy reach.

Added Beauty

Chalmers cars have always been known for their "looks." For 1913, they are even more beautiful than in the past. Flush-sided metal bodies have the graceful bell-shaped back. Dash is of one piece with body.

Chalmers 1913 Models

	"Six"	"Thirty-Six"
Touring Car, 5-passenger	*$2400*	*$1950*
Touring Car, 7-passenger	*2600*	*2150*
Torpedo, 4-passenger	*2400*	*1950*
Roadster, 2-passenger	*2400*	*1950*
Limousine, 7-passenger	*3700*	*3250*
Coupe, 4-passenger	*2700*	*2250*

Prices include full equipment

Handsome nickel trimmings will be regular equipment. Leather lining throughout the body and on the dash leaves nothing to scratch or mar. The Chalmers finish cannot be surpassed.

Three Great Cars

Chalmers cars for 1913 are made in three chassis sizes and fourteen body types.

The "Six" is now offered at the unprecedented price of $2400, a price made possible by our quantity production and increased manufacturing facilities. The "Six" motor, rated at 54 h. p., actually develops 60 to 70 h. p. In every point the "Six" is a maximum car.

The "Thirty-Six" with striking improvements and added features, at $1950, is more then ever an ideal, all-around car. Wheel base is now 118 inches. Full electric lighting, Chalmers self-starter, reliable speedometer —are all furnished on the "Thirty-Six."

New "30," self-starting, $1600 with improved motor, 34 x 4" tires, demountable rims, large brakes, beautiful new flush-sided body. Two body types, 5-passenger touring car $1600; 4-passenger torpedo $1600.

All cars are fully equipped with top and windshield.

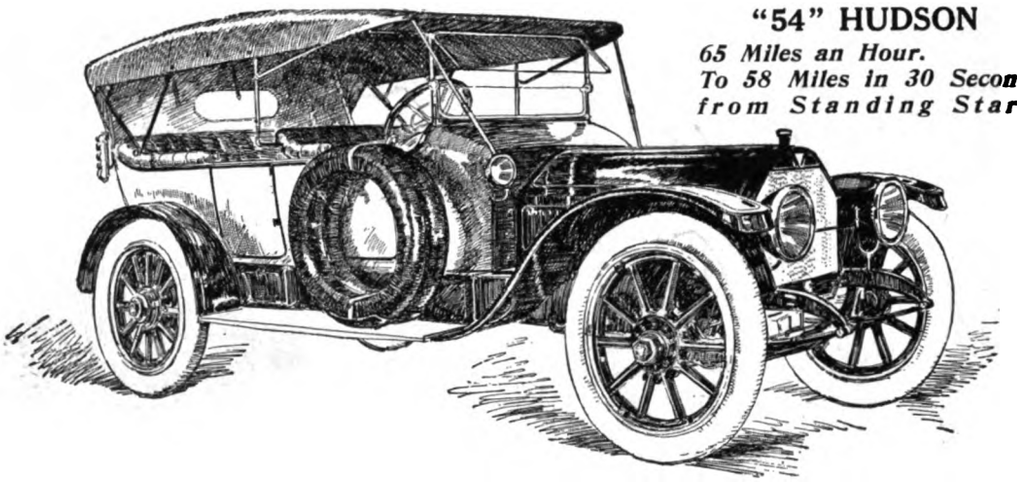
Order now for early delivery so that you can get the use of your car during the best motoring season.

So look these cars over carefully at our dealers' salesrooms. And don't forget to send the coupon for the booklet "Story of The Chalmers Car" and our new catalog.

Please send "Story of The Chalmers Car" and 1913 catalogue
Name .....
Street .....
City ..... State ..... M. W.

Chalmers Motor Company, Detroit

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"54" HUDSON
65 Miles an Hour.
To 58 Miles in 30 Seconds
from Standing Start.

Here is the Answer

to that oft asked question: "What will Howard E. Coffin do when he builds a 'Six'?"

The "54" HUDSON answers the question everyone in motordom has been asking for years. All know Howard E. Coffin to be America's foremost engineer. His six famous four cylinder cars gained a reputation for him which led all to expect a wonderful six from him.

But sixes are not like fours, as many a designer has learned to his sorrow. Mr. Coffin realized that and so instead of attempting a six alone, he first secured as his associates, the men who had already accomplished the most in six cylinder designing. His men came from the leading factories of Europe and America. There are 48 in all—representing 97 leading motor car manufacturers. Combined they know just all that has been learned in motor car building. So the "54" HUDSON—Mr. Coffin's answer—is just the composite of what the most successful builders, working together have accomplished.

The Best Car They Know

It is smooth and flexible—the qualities for which sixes are really built, and which inexperienced men seem unable to obtain in the sixes they build.

It is powerful—speedy, beautiful, safe and comfortable. Simplicity is a notable feature, and economy in operation is accomplished as it is in but a few cars.

Not Just Two Cylinders Added to a "Four"

Adding two cylinders to a good four won't even make a poor six. Fours and sixes are entirely different. That is why some sixes give less than 30 per cent. increased power when their weight, and fuel and oil consumption are 50 per cent. greater than the four of same size, to say nothing of the greater first cost.

Comfort—Speed—Completeness

The cushions of the "54" HUDSON are Turkish type—12 inches deep. Backs are high, upholstery thick, springs flexible and the car is so nicely balanced that it will take the worst roads at speed and with little discomfort to passengers.

On the Indianapolis Speedway, a "54" fully equipped carrying extra tires and four passengers did 10 miles at 62 miles an hour. One year ago on the same course a $500 prize was forfeited because none of many of the best known fours and sixes similarly equipped, driven by famous drivers, were able to do one mile in 60 seconds, flying start.

Every detail of motor car comfort is included in the "54."

It is electrically self-cranking, has electric lights, speedometer clock, top, rain vision windshield, nickel plated trimmings—21 coats paint and varnish body finish, demountable rims—36x4½ tires, gasoline tank, with magnetic gauge on rear, robe rails, curtains and all the appointments that go with the highest type of car.

The price for either 5-passenger Touring Car, Torpedo or Roadster is $2450; 7-passenger Touring Car, $2600; Coupe, $2950; Limousine, $3750—f. o. b. Detroit.

See the Triangle on the Radiator

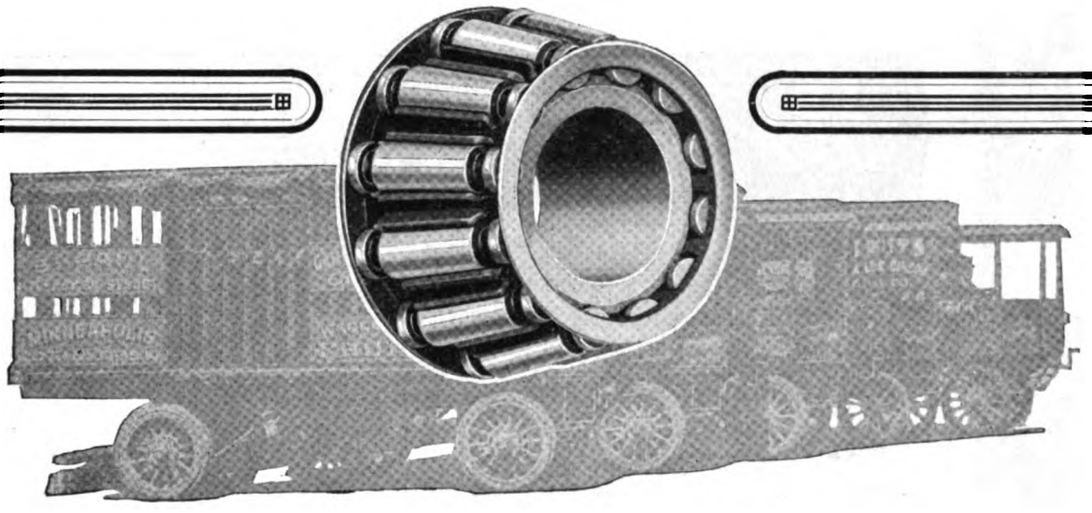
HUDSON MOTOR CAR COMPANY

7476 Jefferson Ave., Detroit, Mich., U. S. A.

(165)

Electric Self-Cranking—Electrically Lighted

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Highest Profits from Motor-Trucks

YOU call for the figures and facts when you consider supplanting horse-drawn wagons with motor-trucks.

Don't overlook facts about the bearings, for bearings have a lot to do with cost of upkeep and with getting full mileage value from the gasoline.

TIMKEN
TAPERED ROLLER BEARINGS

Most of the early truck-builders have come to Timken Bearings after exhaustive tests of other kinds. Most of those who entered the field later have adopted Timken from the start.

From commercial car users, who keep careful figures of upkeep cost, you can learn that Timken Roller Bearings stand up wonderfully well to the gruelling service of the motor-truck.

This is due first of all to the unique principles of the Timken. The heavy load is carried along the length of rollers, not concentrated on the points of balls.

Pressure and hence wear are less because of this distribution. So are the effects of shocks and vibration due to rough roads. End thrust is met because the rollers and cone and cup are tapered. The wear that will come in any revolving parts can be wholly taken up by adjustment, by merely moving the cone farther into the cup.

Timken cones have two ribs that act as a track and keep rollers always aligned. Minute wear is uniform over all the parts and adjustment brings them into the same perfect relation to each other that existed when the bearing was made. Not a single principle of efficiency is altered.

Call for the Bearing facts. You can get them in the "Timken Primer on the Care and Character of Bearings." Write for a copy, sent free postpaid.

The Timken Roller Bearing Company
Canton, Ohio, U. S. A.

The only axle manufacturer licensed to make automobile axles equipped with Timken Roller Bearings is the Timken-Detroit Axle Company

115

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The M&P

Is a Dependable Electric Truck

The M&P

Is a High Grade Truck at a Moderate Cost

Reports from our dealers indicate plainly that we have anticipated and met demand in a field never before invaded by the truck industry.

UNTIL the M & P 1000 pound Electric Truck was introduced, the average moderate sized concern had small inclination to put out an investment of $2500 or more for a gasoline truck.

The purchase price was too high—and the cost of upkeep out of all proportion to service rendered.

Here we offer a quality truck built over design and out of materials that combine to make a motor car which must necessarily give more and better service at cheaper cost of operation than can even be approximated by the high priced, noisy and trouble breeding gasoline outfit.

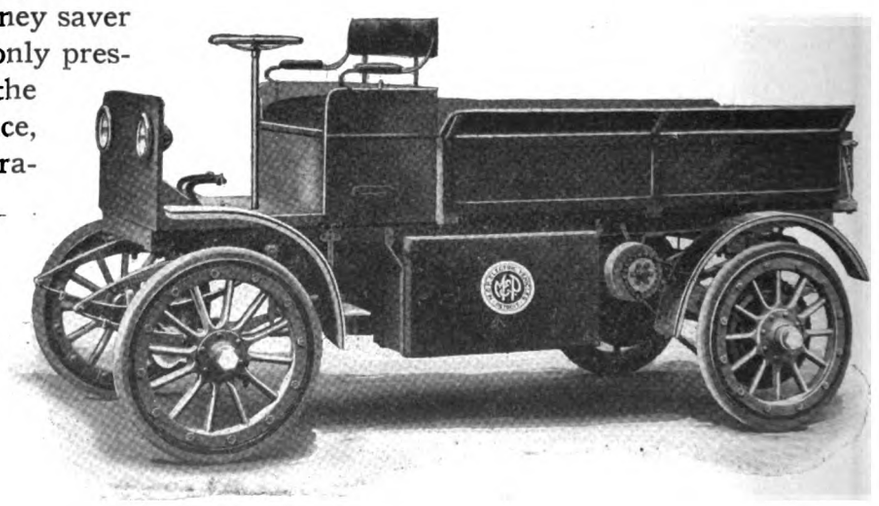
The M & P Truck is a money maker for you, Mr. Dealer, and a money saver for your customer. It is the only present economical substitute for the horse by reason of its endurance, power and cheap cost of operation.

We make but one type of chassis which is sold stripped or with body equipments as noted in this advertisement, and we will stand back of you in a guarantee that it will substantiate every claim we have made for it.

In every community there are those who are doing trucking and delivery with horse drawn vehicles. To such, through you, we are prepared to demonstrate that the M & P Electric Truck is a time and money saver.

We have the proof, Mr. Dealer—do you want it? If so, communicate with us.

The Prices: Chassis $1450—Express Body $1500—Enclosed Body $1600.



M & P Electric Vehicle Company

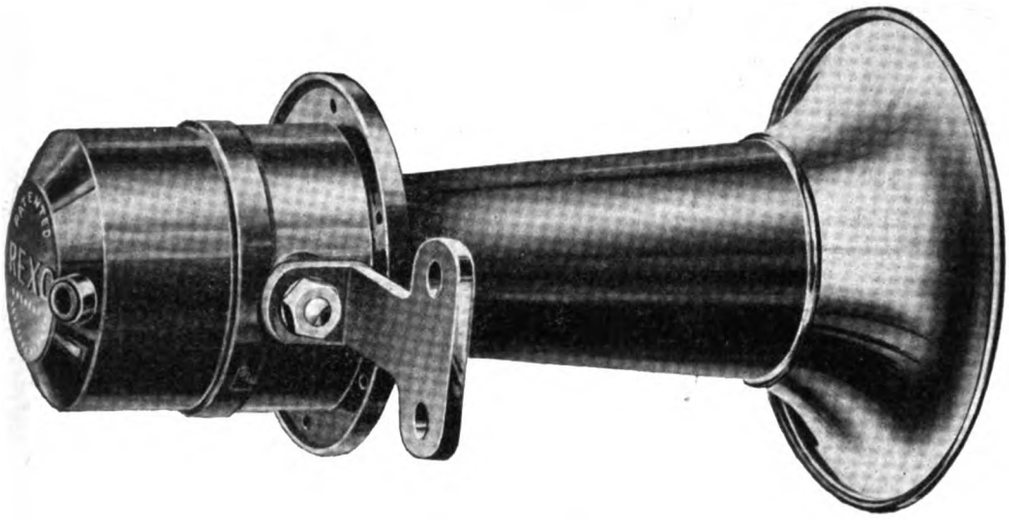
Franklin and Dubois Sts.

DETROIT, MICHIGAN

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REXO

A GUARANTEED ELECTRIC HORN



$8

After several years experience in the manufacturing of the high grade TUTO and TUTOETTE horns, we have been able to incorporate the same reliable mechanism in a single-tone warning signal, which can be sold at retail for $8.00. This new horn is known as the REXO and comes complete with push button and cord and carries the same long time guarantee as the TUTO Equipment.

The standard REXO horn is designed to operate from any 6-volt battery and the current required is never over 1.8 amperes and this current consumption does not increase with wear or with the lack of lubrication or inattention the same as in the motor type of horn. In fact, the REXO does not contain any moving parts which require tri-weekly lubrication, monthly overhauling, washing in gasoline, greasing, etc., nor is there any danger in clogging from dust or moisture. The operation is equally as positive in winter as in summer, as there is no oil or grease to congeal, etc., etc.

The REXO requires no care or attention during the full season of running and only a very slight adjustment is necessary to overcome a full season's wear and this can be done in a few minutes and with an ordinary screw driver, as there are no delicate parts which can be damaged. In fact, it is not necessary to completely remove a single screw, therefore, there is nothing which can become misplaced or lost.

The sound of the REXO is loud, abrupt, clear and unlike the motor driven horn; it is INSTANTLY RESPONSIVE.

You would not put up with a sluggish, slow-accelerating gasoline motor on your car—then why should you consider a warning signal which is slow in getting into action. The depending on such a horn endangers life and property, and once you have tried the quick acting REXO, you would never put up with the other kind.

Remember the REXO is most substantially built from high grade material and is not a cheaply assembled buzzer that will die out after a few week's time.

Many AUTOMOBILE MANUFACTURERS have already selected the REXO as standard for 1913 equipment, after most careful investigation and long life tests. We have made a special under-the-hood horn for use where it is desired to conceal all of the accessories on the car and have so designed the projector as to get the full effect of the warning note, regardless of this enclosed position.

We can supply JOBBERS and DEALERS now with the first reliable electric signal at a popular price, one that will be standard equipment on thousands of cars in 1913.

THE DEAN ELECTRIC COMPANY

260 Taylor Avenue *"Look for Dean where Quality's seen"* **Elyria, Ohio**

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Oakland

The Past, Present and Future of "The Car With a Conscience"

THE OAKLAND has a successful past, a remarkable present and is bound to have a wonderful future. From a dealer's standpoint, the Oakland line looms up prominently as **The** important figure in the automobile industry, for it represents "the happy medium" in motor car construction.

1912 was the most prosperous year in the history of the company and our plans for 1913 insure even a greater year.

The Oakland was the one big surprise of 1912. No other single automobile company, regardless of the price of its product, attracted the attention given the Oakland. It was truly an individual, distinctive line of motor cars. They made a hit everywhere. In the great selling centers, from coast to coast, the popularity of the car was astounding.

The Oakland today is one of the standard motor cars—a position honorably and honestly achieved by building good motor cars, superior motor cars, both mechanically and artistically.

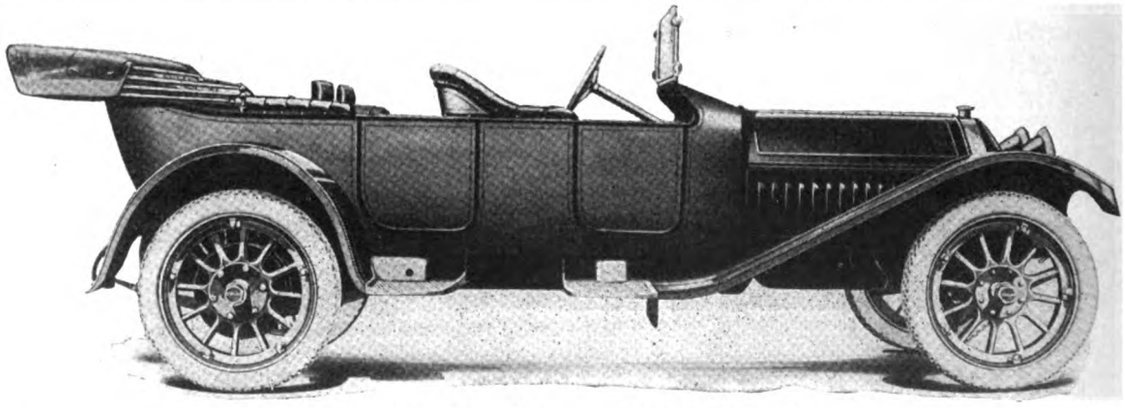
The Oakland line for 1913 is the ideal combination, for dealers to concentrate their efforts upon, to make money and to satisfy and please their customers; for it is a wonderful line of motor cars in design, in quality and in appearance. Exclusive features, beautiful body lines and sound mechanical principles are to be found in every model. Unit power plants are used exclusively.

Here is the Line Briefly Described. Read It.

The Greyhound 6-60—the new Oakland six cylinder chassis; wheel base 130 inches, double drop frame, unit power plant, cone clutch, sliding gear transmission, full floating rear axle, demountable rims, German silver radiator, "V" shaped; 10 inch upholstering, full nickel trimmings, and equipped with electric lighting and ignition system and a self starter at $2400. It will come in 4, 5 and 7 passenger bodies and a raceabout for two.

Model 45—7 passenger limousine; wheel base 120 inches, double drop frame, unit power plant, selective sliding gear transmission, cone clutch, Bosch magneto, $3000.

Model 42 chassis, 116 inch wheel base, double drop frame, unit power plant, cone clutch, sliding gear transmission, full floating rear axle, demountable rims, German silver radiator, "V" shaped; 10 inch upholstering, full nickel trimmings and equipped with electric lighting and igni-



OAKLAND GREYHOUND 6-60—130 Inch Wheel Base, $2400.00

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Oakland

tion system and a self starter at $1600. It will come in a 5 passenger body, a close coupled 4 passenger body and the famous Sociable Roadster (3 passengers—single seat). Also a smart 4 passenger coupe on this chassis at $2500.

Model 40 chassis, 5 passenger touring car; 114 inch wheel base, single drop frame, unit power plant, selective sliding gear transmission, cone clutch, demountable rims, full nickel trimmings and equipped with a self starter at $1450.

Model 35 chassis, 5 passenger touring car, wheel base 112 inches, single drop frame, unit power plant, sliding gear transmission, cone clutch, demountable rims, full nickel trimmings and electrically lighted at $1075. There will also be furnished on this chassis a 3 passenger (single seat) Sociable Roadster at $1000.

With such a complete line, the dealer can command trade from the prospect desiring a $1000 Model 35 runabout to the man seeking a car "De Luxe," like the 6-60 Greyhound at $2400.

For 1913 we have adopted, on a number of the models, a low, overslung, double drop frame, giving a low center of gravity, keeping the machine on the road better; making it safer at high speeds and improving the riding qualities generally.

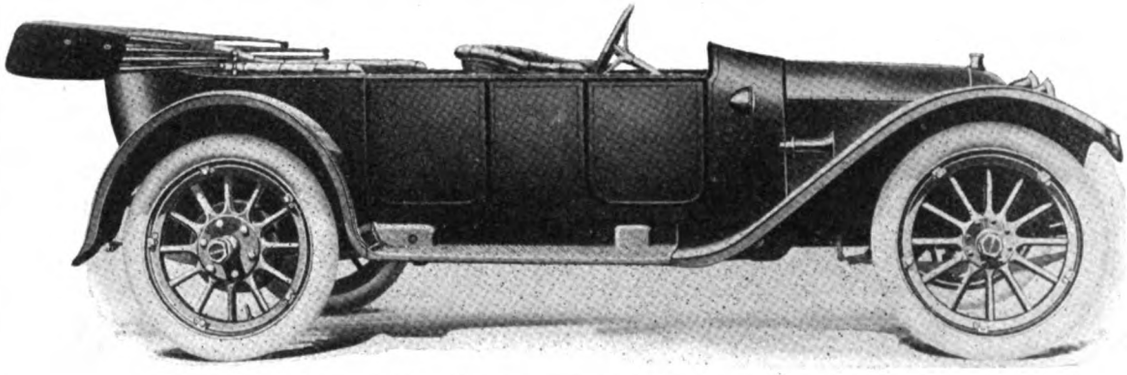
Our new model, the Oakland Six, represents two years of earnest work, and is only offered after having been submitted to most gruelling and satisfying tests. It sustains the reputation and standing of the famous Oakland Fours.

In making up our 1913 line, the dealer, as heretofore, has been kept constantly in mind, for his interests are closely linked with those of the manufacturer.

The output for 1913 is being doubled. Our distribution is being extended to cover, by representation, every county in the United States and the Provinces of Canada.

Good territory is now open in various sections to dealers of proper qualifications. If you are a progressive dealer and want a quick, good seller, fill out the attached coupon and write us also, giving information as to your experience in the automobile business and facilities for displaying and selling cars. If you propose going into the automobile business we would also like to know your training and qualifications for the same.

We will send, on request, photographs and full data of our line.



MODEL 35 TOURING CAR—112 Inch Wheel Base, 3½"x5" Motor, $1075.00

Oakland
Motor Car Company
250 Oakland Boulevard
PONTIAC, MICHIGAN

COUPON

.....1912.

OAKLAND MOTOR CAR CO., Pontiac, Mich.

Gentlemen: I am interested in the Oakland line for the following territory.....

.....

Please send me full particulars.....

.....

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WAIT!

HAVERS SIX 44

THAT the pioneering of the HAVERS "SIX" has had a marked effect on the trade is reflected in the sudden announcement of "sixes" by makers who in the past have ridiculed the idea as a "fad."

The wise and conservative Dealer will not be carried away by such announcements, but will wait to hear from the acknowledged Pioneers of this movement.

For the past three years our efforts have been devoted exclusively to the production of the HAVERS "SIX"—the only moderate price six-cylinder car that has the distinct advantage of being "tried out." Note the significance of these two words, "TRIED OUT."

In addition to the continuance of the standard and popular HAVERS "SIX-44," we will shortly announce another model that will startle the trade with its selling possibilities, and appeal to the motoring public through the perfection of its design and detail, at a price consistent with an absolutely "TRIED OUT" and guaranteed product.

HAVERS MOTOR CAR CO.

Exclusive Builders of Six-Cylinder Cars — Port Huron, Mich.

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A Concrete Demonstration of what an Intelligent Sales Policy will do

¶ The brains that secured the result whereby the Pierce Arrow Motor Car Company felt it good business, of all the equipments they furnish, to *mention Klaxon by name*, are the same brains that dictated the purchase of 52 color pages in Motor World.

¶ Therefore the use of the name Klaxon Horn by the Pierce Arrow Motor Car Co. is not altogether one-sided. While undoubtedly exploiting the Klaxon, they, in turn, are cashing in on the demand created by the Klaxon people for their product.

The Cause (One of them)



How Much Longer

The Car Agent asks the Manufacturer

Car Agent: When are you people going to give us some kind of a real signal in place of that out-of-date bulb-horn?

Manufacturer: That's hard to say. As soon as the prices come down within reach. Or the pressure from buyers becomes so strong that we have to.

Car Agent: The pressure is pretty strong—*right now.* And as far as prices are concerned what good it our claim that no expense has been spared to provide the *best*—of *everything*—if that affects the adoption of an efficient signal? Should not *best* apply to equipment as well as to construction?

Manufacturer: Well, you know there's a mighty big difference between the cost of a bulb-horn and a signal like, for instance, the Klaxon—and this is what you say most buyers insist upon. The bulb-horn we put on now costs us about an eighth of what the Klaxon would cost.

Car Agent: That's all right—as long as you can get away with it. But you can't do it much longer—motorists are getting too wise—ther know too well what a farce the bulb-horn is. The brunt of the deal falls on us. Other makers supply the Klaxon. Customers know it. Right along, to make a sale we have to give them one, and take its cost out of our commission.

Manufacturer: Don't do it. Make them buy the Klaxon themselves. Tell them it's a luxury.

Car Agent: They know better. That's what we've been telling them for a couple of years. You can't argue with them any longer on that score. They know—as well as we do—that it's a necessity. Why as far as that is concerned—we have one on our demonstrating car. Have to. Simply cannot do without it. You can't make a good demonstration—you can't drive a car—and drive it right, unless you *do* have. Buyers know this. They see the Klaxon there—ask if it's regular equipment—and, well, it's mighty hard to explain to them why it isn't.

Manufacturer: Sell them the *car* then—on its merits. Make them *forget* the equipment.

Car Agent: That's all right to say—but nowadays it doesn't work. There are too many good cars whose agents *do* talk equipment—who give them the things we charge them for.

Manufacturer: Well, it probably won't be for long. Sooner or later we will come to it. We have been staving it off. But I guess we can't do it much longer. We will try it another year and see what happens. Then maybe we will put on a "buster" or something—to satisfy their protest against the bulb-horn.

Car Agent: If you think you can satisfy the average car buyer with anything less than the Klaxon, I believe you are mistaken. They know it too well. They know it's the only signal—and so try to hand them anything else would make it harder even than at present. Besides, it's a confession of cheapness which reflects on the car. We must give them the *best* or nothing at all.

26 *different makes of motor cars now carry the Klaxon in their regular equipment. The agents of many of the others supply it without charge to customers that emphatically insist.*

Lovell-McConnell Mfg Company Newark, N.J. U.S.A.

KLAXON

"The Public Safety Signal"

KLAXONET KLAXON

One of 52 color pages *now* running in Motor World

The Result (One of them)



Pierce-Arrow Luxuries

that become necessities

FOUR new models are styled 66-A, 48-B, 38-C and 48-D. Hereafter the year will not be used to designate Pierce-Arrow Cars. You can have almost any kind of body you want fitted to one of these new chassis.

The policy of the PIERCE-ARROW Motor Car Company is to make anything demanded by the majority of its customers a standard part of the equipment of its cars.

Hence the new cars have the PIERCE-ARROW starter operated from the driver's seat, electric lights throughout, controlled from a neat switchboard on the dash, speedometer and clock, Klaxon horn, ventilated with shields, shock absorbers and many other devices adding to the comfort of the driver or the efficiency of the car. When you buy a PIERCE-ARROW Car you buy a complete car ready to run. Not a single accessory need be added.

Deliveries on the New Series have begun. If you contemplate buying a PIERCE-ARROW for next season confer with us at once, that you may not be disappointed as to delivery, and in order to select color and upholstery that you prefer. Every PIERCE-ARROW expresses the individuality of its owner.

Harrolds Motor Car Co.
235 to 239 West 54th Street, New York

Ellis Motor Car Co.
416 Central Avenue, Newark, N. J.
New Jersey Agents

This announcement was published in every important center, where Pierce Arrow Cars are on sale, during the week of July 22nd

¶ The Klaxon people are large and extensive users of trade paper space.

¶ They appreciate Motor World has no "user" circulation, that every one of the 8,000 paid subscribers is either a dealer or a person interested in the manufacture of cars or accessories. 5,000 of them are dealers.

¶ They appreciate Motor World is the only trade paper that has so large a paid trade circulation—the most valuable and necessary class in exploiting the sale of any product. Therefore in Motor World they concentrate their arguments to meet this particular audience.

(OVER)

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More and Better Business for you — and for us —

¶ There are plenty of manufacturers of accessories who are in the same enviable position as occupied by the Klaxon Company—also there are many others who could attain this same position if they would—and we can tell how. It is as simple as A-B-C with a product of known quality. We have cited the Klaxon Company here because it happened to fit this specific instance; there are many other advertisers using Motor World whose story is largely this story—and we would be glad to tell you all about them, if you wish.

¶ Our staff consists of men who have a reputation for "doing things" and are intelligent enough to tell you frankly and bluntly if you ought not to use trade papers—or if you should use them more—or use newspapers or magazines. There is no altruism in this, it's good business, that's all. Address:

Advertising Department
THE MOTOR WORLD
BROCK MATHEWSON, Manager

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The truck of excess capacity and reserve power.

KisselKar truck design and construction take into consideration the occasions when stress of business will necessitate loading in excess of rated capacity. The wide power and capacity margin above ratings meet the needs of a growing business, and furnish a greater reserve strength which decreases up-keep costs.

Competitive tests have demonstrated KisselKar Trucks to be from 15 to 20 per cent. more economical of fuel than other trucks of same ratings.

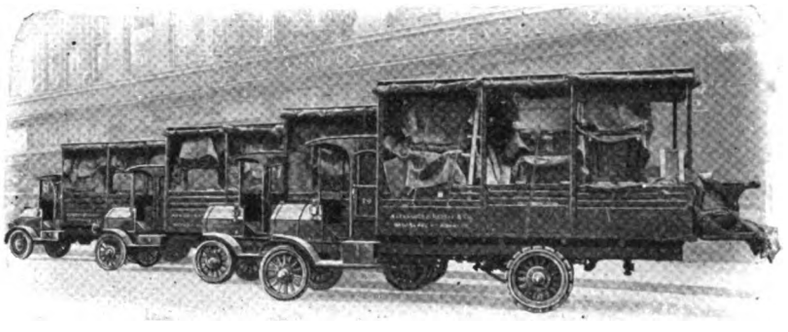
These two factors—excess capacity and fuel economy, which are big items of annual saving, give KisselKar trucks a wide service margin over trucks of average standard.

KisselKar Service

maintains every KisselKar at best working efficiency. This service is supplied by a national service organization maintained by the manufacturers. Specially constructed and equipped buildings at principal points of America are service-centers co-operating with sales agents in supplying a service that lowers operating costs, retards depreciation and insures uninterrupted service.

KISSELKAR TRUCKS

1500 lb., 1, 2, 3, 4, 5 tons



A fleet of 4 KisselKar Trucks that supplanted 40 houses—Owned by Alexander H. Revell & Co., Chicago.

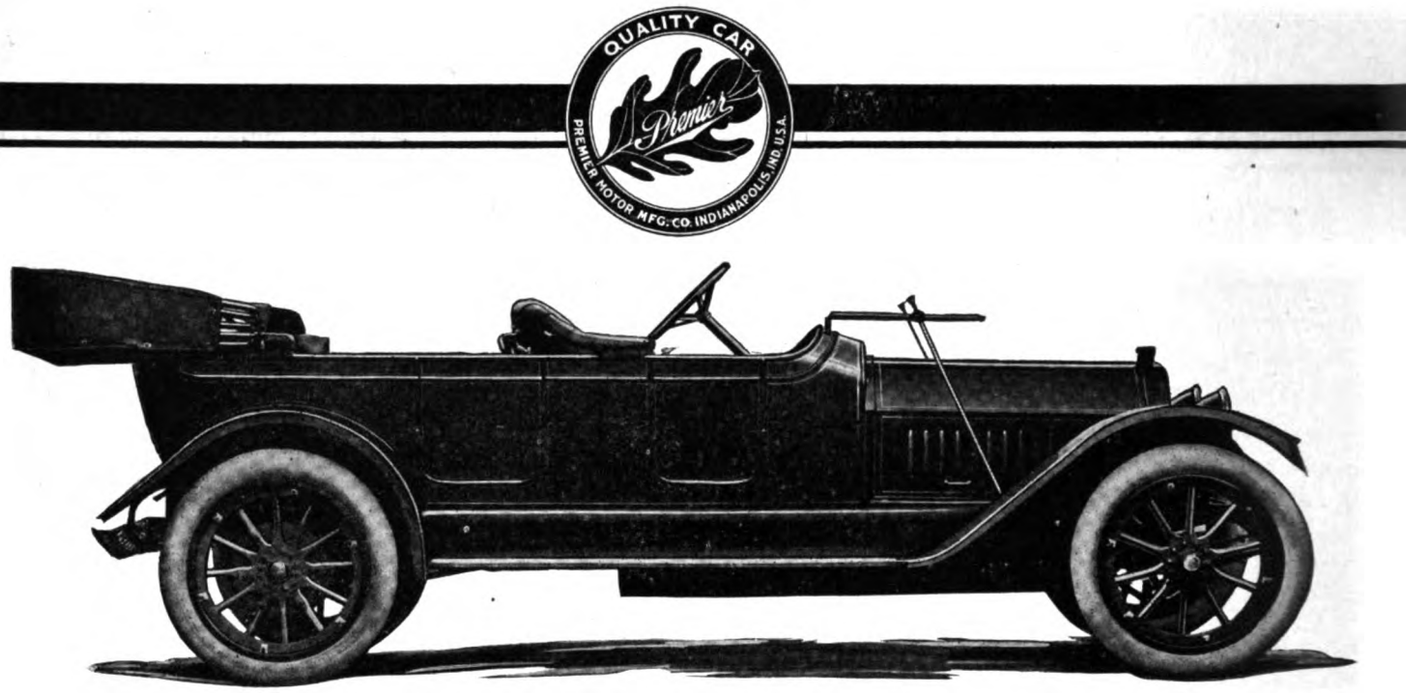
Write for special KisselKar Truck Catalog, illustrating KisselKar Trucks now in use in every kind of haulage and delivery service. All type bodies—special bodies designed to meet special needs.. Write for truck catalog.

Kissel Motor Car Co., 159 Kissel Ave., Hartford, Wis.

BOSTON NEW YORK CHICAGO MILWAUKEE KANSAS CITY LOS ANGELES
MINNEAPOLIS ST. PAUL ST. LOUIS DALLAS

Philadelphia, Cleveland, Detroit, El Paso, San Antonio, New Orleans, Baltimore, Omaha, Butte, Denver, San Francisco, Seattle, Portland, Duluth, Buffalo, Pittsburgh, Hartford, Conn., New Haven, Albany, Troy, Montreal, Quebec, Toronto, Winnipeg, and 200 other principal points throughout America.

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Specifications for the $2600 Little Six Premier

Premier Starter

Will spin your motor.

Tire Inflator

Throw away your hand pump.

Electric Lights—Head, Side and Tail

Current by independent generator.

Liberal Sized Tires

Means low tire cost—36 x 4½ on demountable rims.

Luxurious Upholstering

Deep cushions of hand-buffed leather and best grade curled hair.

Imported High Tension Ignition

Appointments and details are not surpassed by any car at any price. Complete specifications in last week's issue.

Six Cylinder (This Premier will be the big seller of the season. It has the value and reputation. Perhaps your territory is open. We suggest you write today. Premier Motor Manufacturing Co., Indianapolis.) **$2600**
WITHOUT TOP AND WINDSHIELD

Premier Price is from $2600 to $4000 for Touring Cars, Limousine Berlin Coupe and De Luxe to $5000

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1913

Is a Six-Cylinder Year

Are you loading up with the FOURS ? You might just as well tie up with a "one-lunger."

The dealer who does not have a SIX in 1913 will be in as bad a position as was the dealer in 1909 who did not have a FOUR.

A Shortage of Sixes

There will be a total of less than 10,000 SIXES built in 1913 by all the makers who have had a successful SIX on the market two years.

Over 350,000 FOURS will be built this year and all the country clamoring for SIXES. Are you spending your time and energy to resist the tide of public opinion?

Again History Repeats

If it took the builders of the single and two-cylinder cars three to four years to perfect a four-cylinder car, how long will it take the builder of GOOD four-cylinder cars to perfect a satisfactory SIX ?

Think of the step from the one and two-cylinder cars to the four-cylinder cars and the cost in friends and money to the dealer who paid and paid high during the experimental period to bring about the perfection of the FOUR.

PREMIER

America's Greatest Touring Car

is the car of the year. PREMIER is the only one of the five leading manufacturers who have prepared to meet this demand for a high grade six-cylinder car, establishing a new basis of price for high class cars with every comfort and luxury which you have a right to expect of the cars of highest grade—and this at $2600 to the buyer.

Premier Motor Manufacturing Company Indianapolis

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EXPERIENCE — SHELDON — RIGHT DESIGN
FACILITIES — AXLES — RIGHT STEEL
"Made in the Largest Axle Factory in the World"

Axle Talk—No. XVI

The SHELDON Axle Company is a big organization located in a strategical position for getting fuel minus freight charges and steel at low rates of transportation—

As the largest consumers of material in this branch of the industry, they get the quantity cost concessions on quantity purchase of material—

Through precise methods of manufacture and the employment of men skilled in the art of economy of production, they eliminate practically all the expensive wastage that obtains in plants where rule-of-thumb processes and carelessness make the "scrap pile" a big item of expense to be charged up to "cost of production."

Now, who eventually pays the excess price for the axle made in the small plant? Not the axle maker, surely. Then it must be the car manufacturer—

And he usually pays it in inferior quality of axles—in material at least, if not in design.

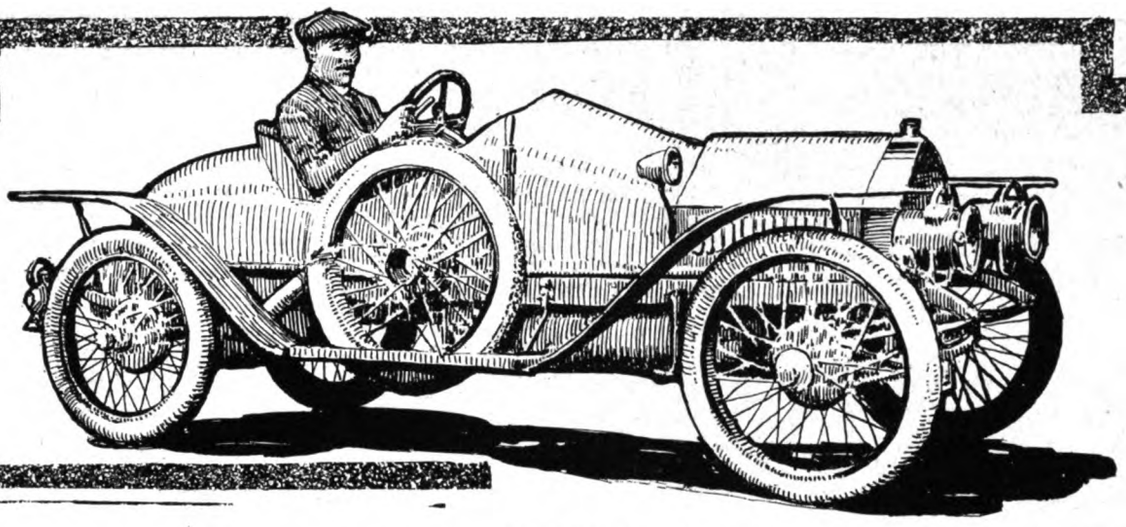
This is the SHELDON principle, concretely expressed:

SHELDON economies of production here set forth go right back into quality axles and springs—and not into excessive profits for their makers—one reason accounting for the liberal salaries paid to engineers, and skilled labor—and the purchase of steel that costs more—and is worth more.

SHELDON AXLE COMPANY, Wilkes-Barre, Pa.

CHICAGO OFFICE—68 East 12th St. DETROIT OFFICE—1215 Woodward Ave.

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Three World's Records Broken on Wire Wheels

The well-known Humber car, illustrated herewith, broke three world's records recently on the Brooklands Track in England. The records broken were the flying half mile, the flying kilometer and the flying mile. These records were substantially broken and considerable credit is given to wire wheels by the manufacturers for this performance.

Not only are wire wheels used by the racing teams because of their great speed but the foreign cars of class for individual use furnish wire wheels as standard equipment because they know and have proved satisfactorily that wire wheels almost double tire life.

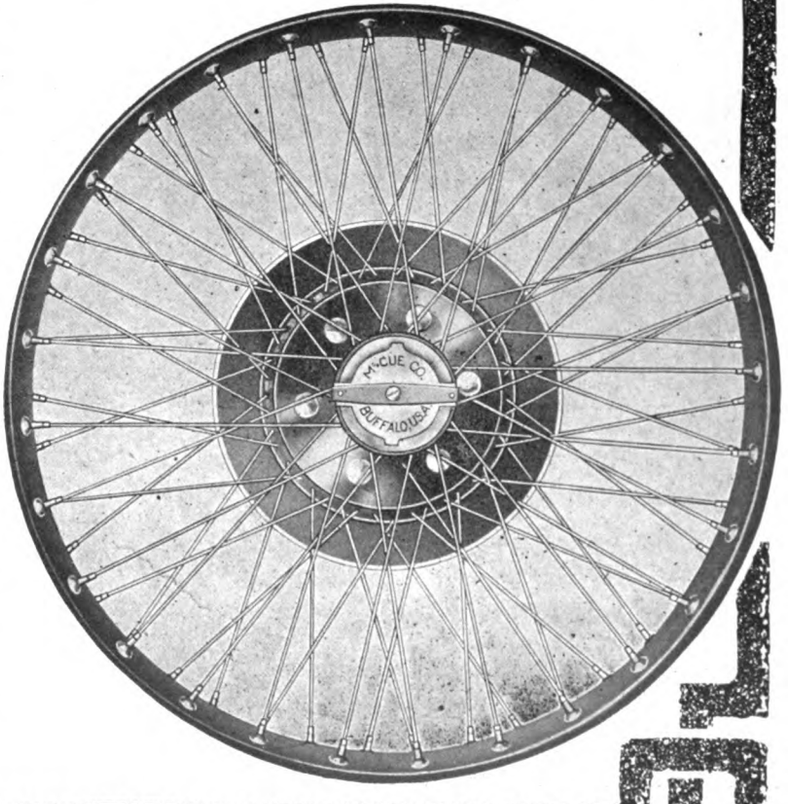
McCue axles are so constructed as to admit of the use of wire or wooden wheels on the same spindle and the McCue company is in position to take care of the demand for wire wheels in this country without any delay.

It should be borne in mind that McCue detachable wire wheels are easier to mount and dismount than a demountable rim.

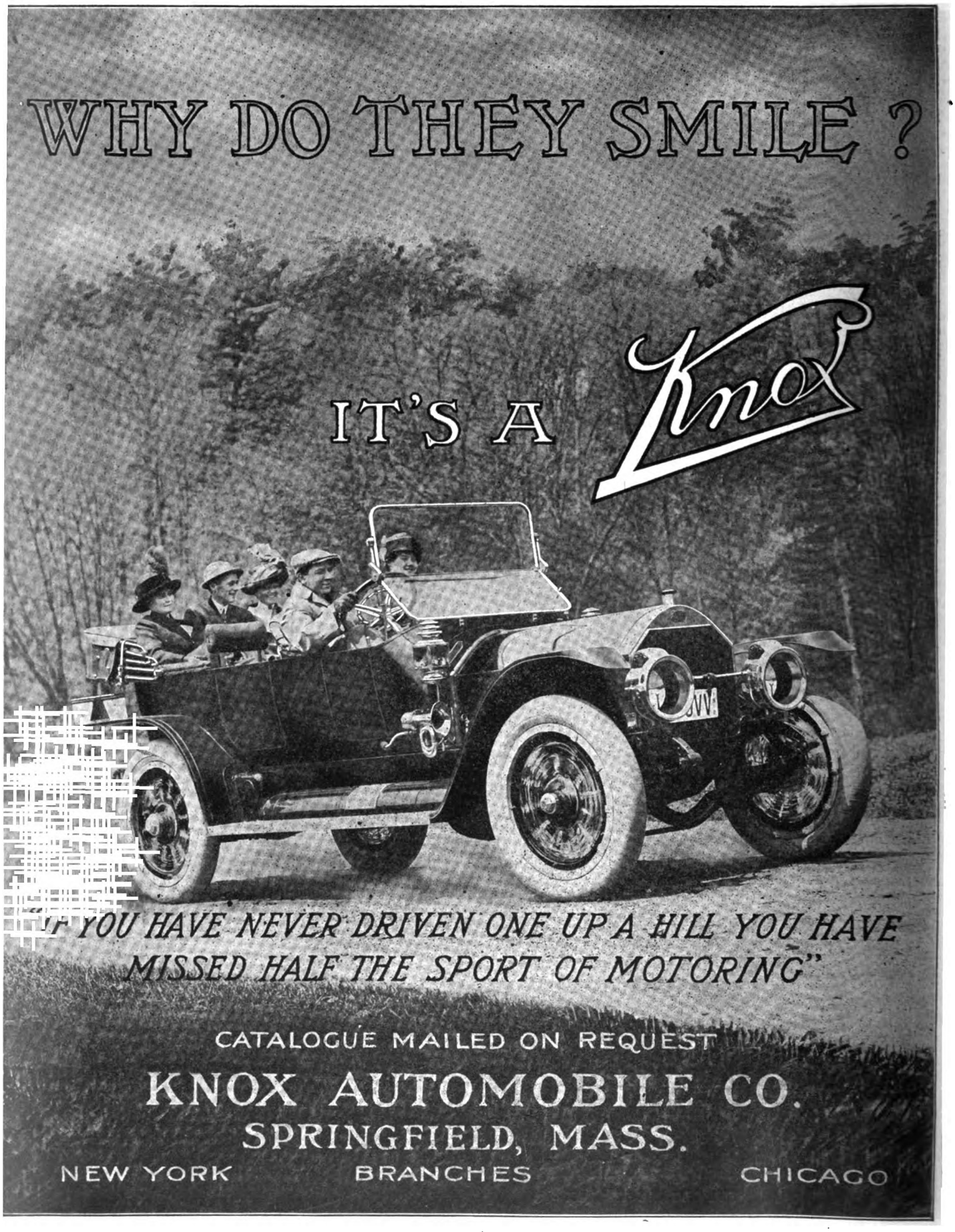
The McCue Company
BUFFALO, NEW YORK

70% MORE TIRE MILES

WIRE McCUE WHEELS



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WARM HAND WHEEL

A Practical Necessity

Dealers who sell commercial trucks with heated steering wheels will find that they have an enormous sales leverage over those who sell trucks that are not heated—and it does not require a great deal of argument to show you that this is true.

Motor Trucks must be operated in winter as well as in summer to register the full economy of truck delivery over horse delivery.

It is also a patent fact that if your truck operators are comfortable, they will do more work and possibly better than if they are uncomfortable.

Obviously if your truck driver is uncomfortable there is no doubt but that during the winter his work is going to suffer and he is going to take time whenever the opportunity offers to get warm.

Save your customer this loss of time if you want to consider the cold business facts by equipping the truck you sell him with a Warm Hand Wheel.

The Warm Hand Wheel will keep the feet and hands of the truck driver just as warm in cold weather as they are in summer weather.



You know if a man's hands and feet are warm his entire body is warm.

Aside from the commercial view-point, there is a humanitarian condition regarding winter driving. If, without expense, a truck operator can keep his men warm, it is up to the truck operator to do so.

So far as you are concerned, Mr. Dealer, this is a story which interests your pocket-book and interests it deeply. Put your shoulder to the wheel and insist that the manufacturer of the truck you sell equips his truck with a heated steering wheel.

To the manufacturer this story is plain, cold business. By supplying your consumers with a truck equipped with a Warm Hand Wheel you are benefiting them financially and building for yourself a goodwill and prestige that is worth dollars and cents to you.

Electric Truck Makers Note!

The Warm Hand Wheel may also be operated by electricity at less cost than required to light your lamps. Cost of installing an electric Warm Hand Wheel on your electric trucks is extremely low. Write us for details.

WARM HAND STEERING WHEEL COMPANY, 527 Fifth Ave., New York

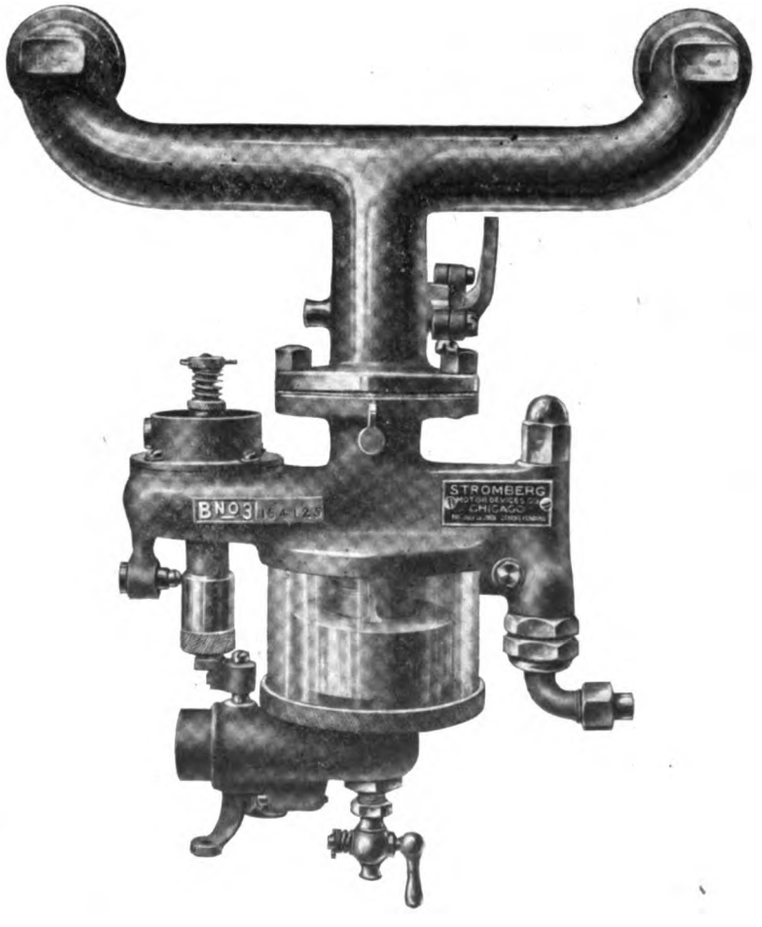
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New STROMBERG for Ford Cars

TO meet the demand from Ford owners for a complete Stromberg equipment at a reasonable price we have established a special department to make nothing but Stromberg Carburetors and manifolds for Ford automobiles.

Our increased and specialized production in this new department now enables us to offer our latest improved Type B 3 Stromberg with Ford manifold, ready for installation, at the remarkably low price of $20.75.

This new carburetor is even more economical than our old type B 3, and is made with the same care and skill as are all our various other models.



Inasmuch as we are already feeling the effects of the demand for this new model, we would request that you get your order in at once so as to get an early delivery and thus receive the benefits and enjoyments that accrue with the use of a Stromberg Carburetor.

Stromberg Motor Devices Company
69 East Twenty-fifth Street
CHICAGO, ILLINOIS

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Remember—Abbott-Detroit cars are *"Built for Permanence" and "Guaranteed for Life"*

Abbott

Some General Remarks on Advertising

ADVERTISING used to consist largely of such phrases as "Best in the World," "Highest Quality of Workmanship," "Lowest Price," "In a Class by Itself," and so on.

Not so today.

The public no longer accepts any of these phrases at their face value, unless substantial proof is forthcoming.

The most progressive firms realize this and consequently they are endeavoring to make their advertising an honest and straightforward exposition of the merits of their product.

Abbott-Detroit advertising will be this.

We shall give you the reasons why we say:—Abbott-Detroit cars are the **best cars in the world at the price;** why they are **high grade in every respect;** why they are **powerful;** why they will **climb hills easily;** why they are **roomier** than other cars; why they have **speed** and **reserve power;** why they are **comfortable;** why they will **keep the road;** why the **cost of upkeep is small;** why they run with **less noise;** why they give **general satisfaction** to the user.

Incidentally we intend to tell you of a few "tricks of the trade,"—some of the ways in which you can distinguish inferior workmanship and check up for your self the important details of motor car construction.

You can then make your choice with a full knowledge of what you are buying.

We shall gladly leave the result to you.

Abbott-Detroit Electric Self-Starter

All 1913 Abbott-Detroit cars are equipped with our own specially designed, ***self-contained electric self-starter.***

Not an experiment—not an attempted combination of ignition, lighting and starting, but a real, dependable self-starter, ***built*** as a ***part*** of the engine, included as ***regular*** equipment.

Visit our Sales rooms and have its operation explained.



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Detroit

"The demand of the day is that an organization shall be judged by its product and not by what it claims for itself"

ABBOTT-DETROIT cars have not been designed by any one man. Their points of superiority come from no one source.

They are logical combinations of the ideal designs of over three hundred automobile dealers, and many hundreds of owners.

They are the resume, you might say, of the best suggestions from hundreds of motorists who use Abbott-Detroit cars.

Most of these men have owned many makes of automobiles, have driven cars for the last eight or ten years. Many of their suggestions, to our minds, have been valuable and we have incorporated them in our new models.

These ideas of our users and dealers have been incorporated in the design of our cars by our Engineering and Mechanical Department in such a way as to fully take care of the needs and wishes of Abbott-Detroit owners, and at the same time comply strictly with the dictates of the real, up-to-date engineering and metallurgical practice.

That's why Abbott-Detroit 1913 cars are the **best in the world at the price.**

"BUILT FOR PERMANENCE and GUARANTEED FOR LIFE"

Models and Prices

34-40	Fore-Door Roadster, 116-inch wheel base	$1700
34-40	5-Passenger, Fore-Door Touring car . . . 116-inch wheel base	$1700
44-50	5-Passenger Fore-Door Demi-Tonneau . 121-inch wheel base	$1975
44-50	7-Passenger Fore-Door Touring car . . . 121-inch wheel base	$2000
44-50	Battleship Roadster, 121-inch wheel base	$2150
44-50	7-Passenger Fore-Door Limousine . . . 121-inch wheel-base	$3050

Advance Catalog on Request

ABBOTT MOTOR CO.
607 Waterloo Street
Detroit Michigan



Remember—1913 Detroit-Abbott advertising will be printed in **serial** form, appearing weekly in all of the well known trade papers and in the Saturday **Evening Post, Collier's, Literary Digest and Life.**

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LBA

The Reinforced LBA Storage Battery for Electric Lighting and Electric Cranking Has no Imitations that are "Just as Good"

You don't have to take anybody's word for this, not even ours. You can find out for yourself by TESTING.

We urge you to TEST—the others, then the LBA, and while you are TESTING bore into the pillar posts of your cranking battery and see if they are reinforced with copper which has 13 times the conductivity of lead. If you can't find the copper, your battery will not maintain the necessary voltage for emergencies.

USE THE CLASS A LBA BATTERY WITH AN ELECTRIC LIGHTING GENERATOR

USE THE CLASS B LBA BATTERY WITH AN ELECTRIC SELF STARTER

Write us for information

WILLARD STORAGE BATTERY CO.

CLEVELAND, OHIO

New York Branch, 136 W. 52d Street Chicago Branch, 436 S. Dearborn Street
Detroit Branch, 1191 Woodward Avenue

Depots in all principal cities in the United States, Canada and Mexico

LBA BATTERIES

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Firestone



Quick Detachable **Demountable**

RIMS

For All Tires—Clinchers and Straight-Side

—are being adopted as regular equipment by one high grade auto maker after another. They are universally approved because they are universally efficient.

Firestone Quick-detachable Demountable Rims are the only ones which have met the tests of time triumphantly. The reasons:

They are made according to that same know-how which has kept Firestone Tires unchallenged leaders for a period of 12 years.

Firestone Rims are simple—they have no complicated parts to get out of adjustment, or rust together. A wrench removes the rim—any thin, flat tool removes the tire whether rim is on or off the wheel.

Firestone Rims have a no-split base. No moisture can get into the tire to decay and ruin tube or casings.

Firestone Rims have continuous bearing surface. No wedges are used with Firestone Rims — there is nothing to work rim out of true.

The rim which leading auto makers adopt, is the sure service rim for auto users to demand.

The rim which universally satisfies the user, is the sure business getter for the dealer to handle.



No-split base protects tire from moisture and decay

Learn all the facts—our Rim Book is ready for you

The Firestone Tire and Rubber Co.

"America's Largest Exclusive Tire and Rim Makers"

Akron, Ohio **All Principal Cities**

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The New Twitchell Positive Lock Stop Air Gauge



A gauge that will outlast and outwear any other device of its kind on the American market.

Above all, it's the only gauge that will register accurately always—regardless of age and usage—this for two reasons—

First—The Twitchell Gauge is all metal, containing no rubber washers or other perishable material, which deteriorates and wears out in a few months.

Second—There is positively no wear or friction on internal or external parts.

The Lock Stop Feature

Use this device whenever you want to—on darkest roads or dimly lit streets. It will remain at pressure until you are ready to put it back to zero—for five minutes or a year—just as you please.

The Twitchell Gauge

tells your tire pressure story—with it you can get more mileage out of the tires, because you can always keep them at right pressure.

The Twitchell Gauge is tire insurance for a dollar—order one from your dealer or from us direct.

THE TWITCHELL GAUGE COMPANY

1256 Michigan Boulevard **CHICAGO, ILL.**

Why Take a Chance When Safety is Cheap?



Price
$12.00

Insurance statistics show that three out of every five automobile injuries are sustained while cranking the motor.

The CUKOR SAFETY CRANK is the only simple and perfected device of its kind on the market which positively eliminates cranking dangers. Made of chrome nickel steel, easily attached to any car, and infallibly safe.

Made for trucks, pleasure cars and motor boats.

With the "CUKOR SAFETY CRANK" back-fires are no longer a bug-bear. You can spin your motor without a thought of danger.

Don't wait until your old crank gets you. Get a "CUKOR" now and avoid the possibility of a broken wrist or arm, and its attendant inconveniences and expense.

However dependable your self starter may be, hand cranking is often necessary. Don't court danger! Throw away the old "kick" crank and play safe.

Explanatory booklet free on request.

Ask your dealer or write direct.

THE CUKOR SAFETY CRANK COMPANY

U. S. Rubber Co. Building **NEW YORK CITY**

Live Dealers and Agents Wanted in Every Locality.
Write for Exclusive Territory and Special Terms.

Write or Wire

POLSON

Buffalo, New York

for the very highest grade of brass goods that can be produced at prices that are right.

Folding Auxiliary Seats

Windshields

Bumpers

Wheel Pullers

and the one

Gasoline Engine Starter



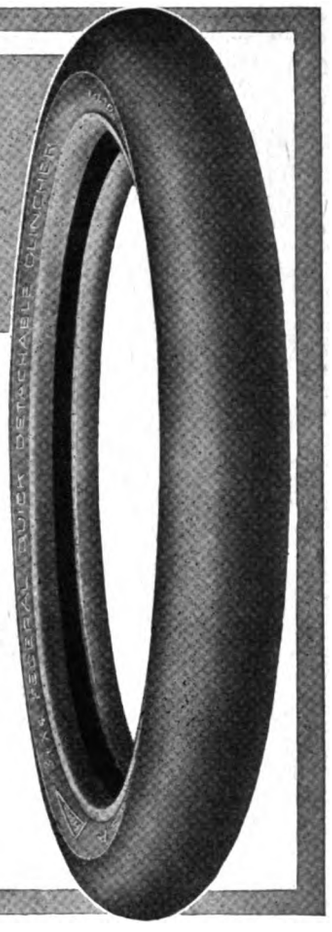
that is

Positively Sure to Start
Positively Safe to Start

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"Extra Service"

FEDERAL TIRES



Convince yourself of their durability—

Comparison with other tires is what emphatically places Federal Tires in a class by themselves—the strongest advocates of these "extra service" tires are experienced car owners who have tried all other tires and have personally demonstrated the superiority and the unusually lasting service Federal Tires render. Federal Tires are *quality* tires—built to give *extra* service.

Made in all types for all standard rims

Federal Tires are supplied through leading dealers everywhere. An interesting tire book mailed to all who write.

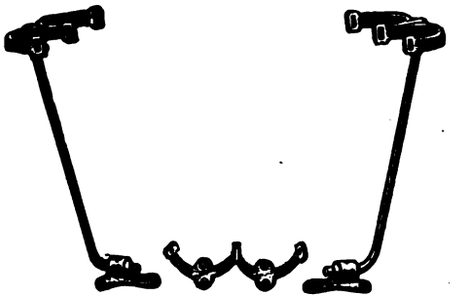
Federal Rubber Manufacturing Co. Milwaukee

BRANCHES AND AGENCIES—*New York, Boston, Chicago, Kansas City, Minneapolis, Denver, Indianapolis, Columbus, St. Louis, Louisville, Omaha, Houston, San Antonio, Little Rock, Atlanta, Los Angeles, San Diego, Pasadena, New Orleans, Portland.*

The Largest Automobile Supply House in America

FIFTEEN STORES IN THE UNITED STATES

"Torpedo" Tire and Demountable Rim Holders



Designed especially for use on Torpedo body or Fore-door cars. Set consists of two strong arms firmly bolted to running board and permitting of sufficient adjustment to accommodate two tires or demountable rims, of standard sizes, 4 inch or smaller. Made of solid Brass and guaranteed to give perfect satisfaction.

Finish: Furnished in Hard Rubber Black Enamel finish, and full Polished Brass.

	Brass	Black
Price, complete with Straps...	$4.00	$3.00

A dozen other styles and sizes in stock. See catalog.

Our 1912 Catalog, which is held as a book of reference by manufacturers, dealers and automobile owners, will be mailed on request. Circulation limited to 100,000 copies.

Chas. E. Miller

MANUFACTURER, JOBBER, EXPORTER AND IMPORTER

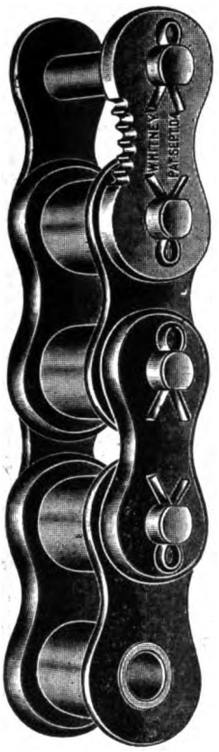
HOME OFFICE

97-99-101-103 Reade St., New York City

ORDER FROM NEAREST BRANCH, ADDRESS CHAS. E. MILLER

NEW YORK CITY—97-103 Reade St.
NEW YORK CITY—924 Eighth Ave.
NEW YORK CITY—2782 Broadway.
BUFFALO, N. Y.—324 Main St.
BROOKLYN, N. Y.—1421 Bedford Ave.
ALBANY, N. Y.—135 Central Ave.
BOSTON, MASS.—202-204 Columbus Ave.
HARTFORD, CONN.—274 Trumbull St.
DETROIT, MICH.—227-229 Jefferson Ave.
CLEVELAND, OHIO—1829 Euclid Ave.
PHILADELPHIA, PA.—918 North Broad St.
ATLANTA, GA.—66 Edgewood Ave.
NEW ORLEANS, LA.—601-603 Barrone St.
NEWARK, N. J.—274 Halsey St.
SPRINGFIELD, MASS.—Bridge and Dwight Sts.

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"WHITNEY" CHAINS

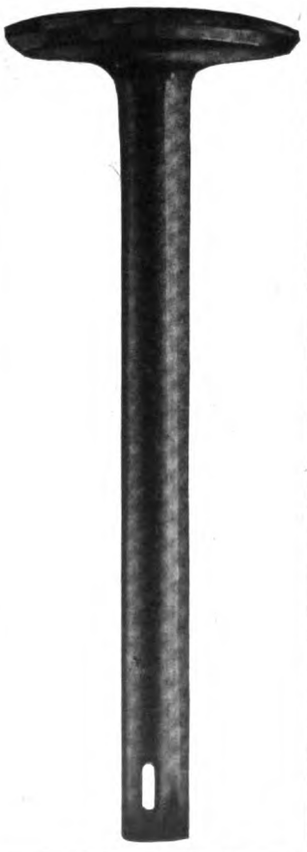
Are Used by the Leaders

Look for the Cotter Pins

The Whitney Manufacturing Co.

HARTFORD, CONN.





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very carefully and read it twice, if necessary.

Is there any part of an automobile engine, or any other gas engine, that is more important to its efficiency than a Valve?

Your engine leaves the factory running smoothly and sweetly—tuned up to its highest power. Perhaps the valves pit—warp—go out of shape—fail to hold compression. Then the power diminishes, and what can be more aggravating to the driver, who has known the fullness of the pulling power of his motor, than to have it grow less and less?

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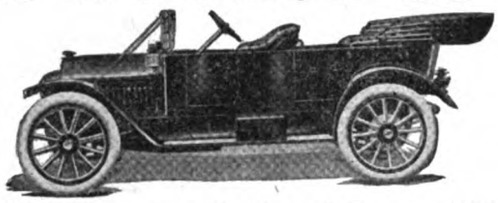
THE ELECTRIC WELDING PRODUCTS COMPANY

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Moline "35"



"King of the Road"

THE phenomenal records made by the "Dreadnought" Moline "35" in winning four great Glidden, Reliability and Economy Tours in the past two seasons have left an impression of "quality" that is publicly recognized wherever and whenever you drive the MOLINE—the car with the famous

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Write for Catalog, Edition de Luxe, showing the four new Foredoor Self-Starting Models—Five-Passenger Touring, Four-Passenger Roadster and Two-Passenger Roadster.

Prices, $1600 to $1700 [31]

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DEPENDABILITY and Reliability are inseparable from Quality. In steering gears, Reliability is of vital importance. It is not a matter of money—it's a matter of safety.

Warner Steering Gears, Mr. Manufacturer, are your best pledge of Safety, which means a Big Asset in your business. You are justified in using them by our eight year old reputation for building the highest grade steering gears produced.

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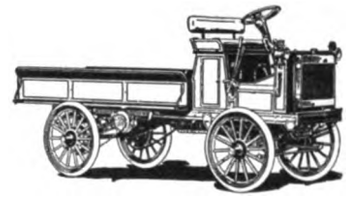
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have an enviable reputation on both sides of the water, for accuracy, uniformity of material and faultless construction. The number of quality cars upon which they are standard proves this.

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are at your disposal, in the matter of solving the bearing problems with which you may be confronted. In this department we co-operate with you in figuring on loads, speeds, etc.

Send your blue prints and other information. The service is free.

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A 30 Horse Power Six Cylinder Car $2800

A small powered six.

Motor is only thirty horse-power—a big motor is not required in a small car.

In a motor so small, the flexibility and smooth running of six-cylinder construction are very pronounced.

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Send for "Little Six" booklet. Catalogue of all models mailed on request.

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$1,675	$2,150	$2,750

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A New Big High Grade Delivery Car Built by Experienced Makers and Selling at a Moderate Price.

We want live dealers—lots of them. We have a proposition that will make money for you. Our terms are most attractive. Our cars are easy to sell.

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Separate from and having no connection with the Lippard-Stewart Motor Car Company.



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Insist on having the original and best. Every foot of RAYBESTOS is stamped with our trade mark. **It costs the car owner no more** and our reputation is your guarantee.

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We also make Duplex and Raymond Brakes and Gyrex, the Mixer.

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(KNIGHT TYPE MOTOR)

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Price $75

Warner
AUTO-METER

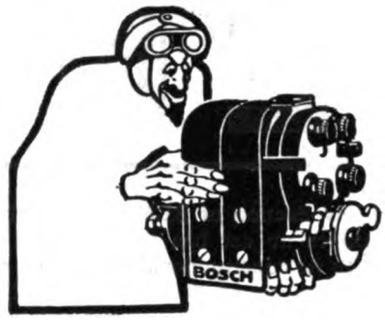
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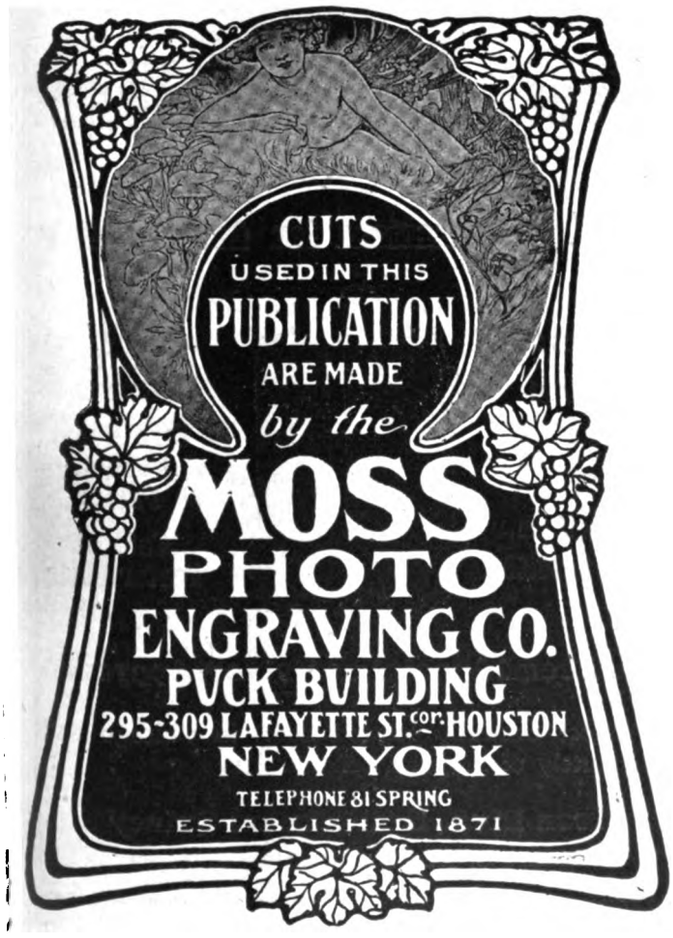
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By Bosch All Others Are Judged
Be Satisfied Specify Bosch

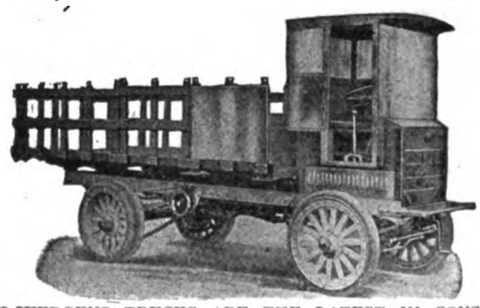
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Allowance made for any make of Magneto.

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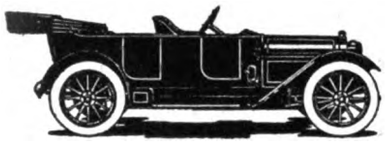
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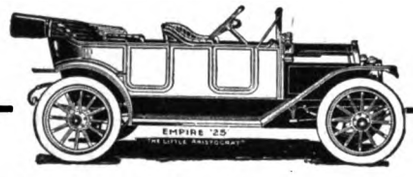
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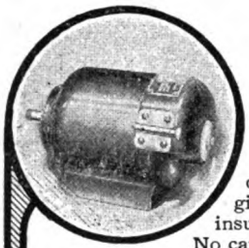
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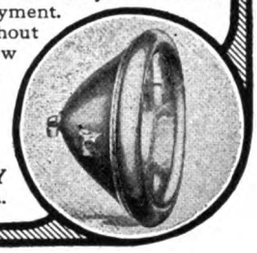


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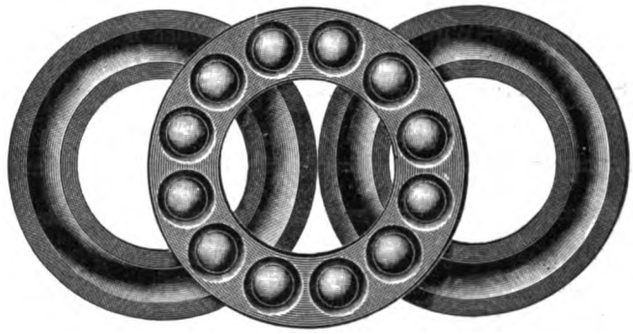
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Ignition Absolutely Sure
RAJAH AUTO SUPPLY CO. BLOOMFIELD, N.J.
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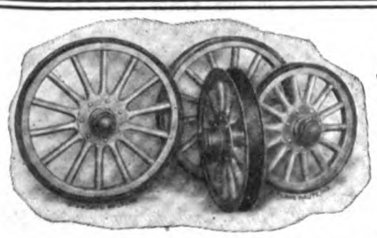
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Don't delay—write now for booklets, data, prices, testimonials of users, road tests, etc. Mention size and kind of tires you use.
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Kinwood Oilers, Gaskets,
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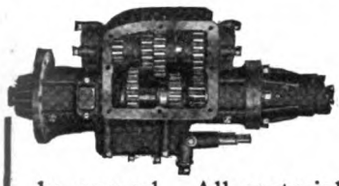
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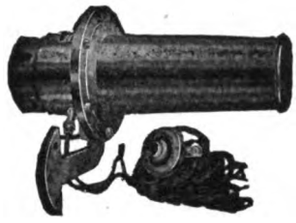


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Motor 3¼ x 5½ inches; four cylinders; Bosch magneto; three speed sliding gears; tires 32 x 3½ inches; 106 inch wheelbase. Equipment includes windshield, gas headlights, generator, oil lamps, tools and tire repair kit.
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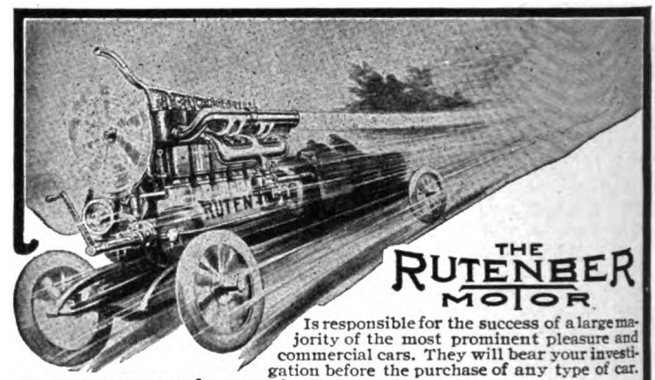
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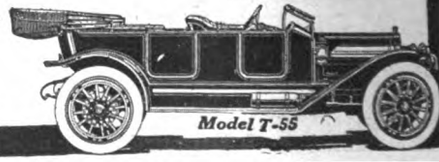
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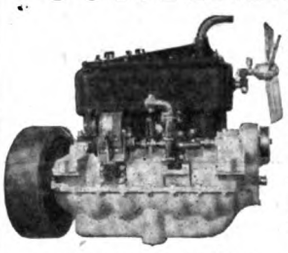
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Beautifully Finished—Perfectly Equipped Easily Operated
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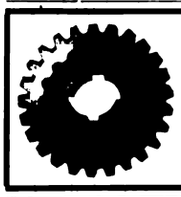


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Is "As Dependable as Niagara"
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Bakes to either a high gloss finish, egg-shell gloss or dull finish, on lamps, radiators and fenders. Will not crack, chip or peel.
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AUTOMOBILES—A. C. C. A. Prices Talk! Every make. Every model. Hundreds runabouts, racy roadsters, five-seven passenger touring cars. $50 up. Guaranteed five years. Shipped Freight Prepaid! Write today for the largest Illustrated Catalog published! THE AUTOMOBILE AND CYCLE COMPANY OF AMERICA, Dept. I-N, 1769-1787 Broadway, New York City.

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Makes a new lining out of a dirty, faded and stained inside. Will not fade or wash off. Leaves the cloth soft and pliable.
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FORD OWNERS—GET OUR CATALOG. AUTO PARTS CO., PROVIDENCE, R. I.

TO RESPONSIBLE parties only—Packard 18 touring car or limousine, will rent monthly or winter season with driver; reasonable. For full particulars write only to S. S. ZULA, 322 Columbus Ave., New York.

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Enamels lamps, radiators and fenders to a fine gloss finish. Will not crack, chip or peel. Not affected by heat, retains its lustre.
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WELL EQUIPPED Auto Tire Repair Shop, best location in South, doing good business all year round. Vulcanizing capacity per hour, 3 casings, 40 inner tubes. Good reason for selling. J. JAMES, care Box 483, Greensboro, N. C.

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Makes leather, rubber and pantasote tops and curtains look like new. A safe, durable renovator that leaves the cloth soft and pliable.
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ONE 35 H.P. Parry Runabout, complete with top, $650. H. KASKEL, Spencerville, Ohio.

FOR SALE—Fully equipped plant for the manufacture of vehicles and automobile bodies, located at 28 to 32 Bank street, Trenton, New Jersey, and occupied by the FitzGibbon & Crisp Carriage and Wagon Co. Buildings consisting of four-story main factory, three-story trimming and store house, blacksmith shop, lumber sheds, etc. A live going proposition doing a large business in vehicles and automobile bodies, to be sold at Receiver's Sale on August 23rd, 1912, at 2 P. M., on the premises. JAMES C. TATTERSALL, Receiver.

FOR SALE—Dealer in new and second-hand automobiles; Ford runabout, 4 cyl., 26 H.P., top, windshield, rumble seat. Maxwell runabout. Oldsmobile, 4 cyl., top, 5-passenger, and windshield. Rambler, 2 cyl., top, 5-passenger, and delivery body, all in good condition. F. B. ARDRIE, 21 Carnes St., W. Lynn, Mass. P. S.—Wanted—to buy 50 automobiles.

FOR SALE—6 cylinder Franklin engine complete with magneto, carburetter, fine condition, $175.00. BOX 210, care Motor World.

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Any Kind Every Kind Stock, or to Blue Print

Rims

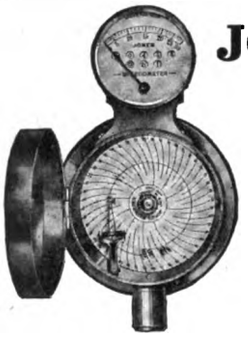
Clincher Q. D. Demountable Channels

For Automobiles, Motor Trucks, Aeroplanes, Motorcycles, Bicycles.

We Also Make Axles and Hubs.

MOTT WHEEL WORKS, Utica, N. Y.

R. B. ABBOTT SALES CO., Sales Agents, Detroit



JONES RECORDER

Gives time, speed and distance. Number of stops—length of each stop. Complete record of every movement or stop of vehicle marked on chart. Absolutely essential to all operators of motor trucks or delivery wagons.

The Jones Recorder consists of a strong brass casing, containing a clock work and flexible shaft from the drive wheel of the vehicle.

THE JONES SPEEDOMETER

Commercial Vehicle Department 13 and 15 Canal Place, New York

---

Magneto Bargains

$30.00 for a **$105.00** 6 cylinder
$20.00 for a **$93.00** 4 cylinder
$18.00 for a **$65.00** 2 cylinder
$16.00 for a **$60.00** 1 cylinder

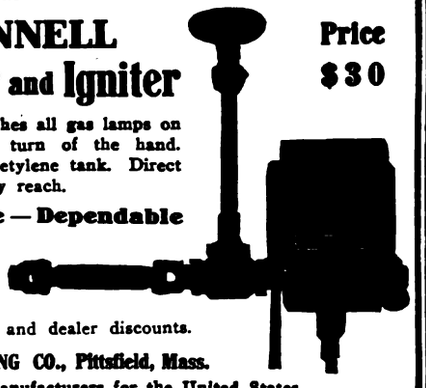
Imported U. & H. High Tension Magnetos Less Than Import Cost

Circular and Price Lists Free

J. S. BRETZ COMPANY, 250 W. 54th Street, New York

THE GRINNELL Gas Controller and Igniter

Price $30



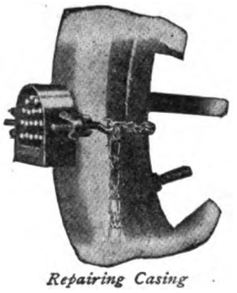
Lights, dims and extinguishes all gas lamps on the car through a simple turn of the hand. Coupled to valve-stem of acetylene tank. Direct control. Always within easy reach.

Convenient—Safe—Dependable

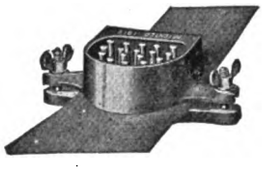
Every car owner in your vicinity, Mr. Dealer, will be interested—it's up to you to show them—and sell them. Write for booklet and dealer discounts.

THE G. C. A. MANUFACTURING CO., Pittsfield, Mass.

Sole Licensed Manufacturers for the United States



Repairing Casing



TIRE CUTS ruin casings. They admit moisture to the carcass, cause the fabric to rot and weaken, grow larger—end in blowouts.

You can repair **CASINGS** and **INNER TUBES** anywhere in 15 minutes, better than a Repair Shop can do —and for *one cent.*

Universal Auto-Vulcanizer

Patented

A practical vulcanizing outfit complete, with enough repair gum to make 40 patches. It weighs 3 pounds and can be carried in the tool box. **Simplest and most satisfactory device for eliminating tire troubles that has ever been devised.**

Absolutely automatic. Place the patch—attach the Vulcanizer—put in the gasoline—light it. No further attention required. In 15 minutes the job is done.

It *can't burn, scorch* or *injure* tube or casing. It *can't* get out of order. It *can't* fail to do its work. So simple, anyone can operate it. The Universal Auto-Vulcanizer saves its cost a *hundred times* over in trouble and expense.

Price Complete, **$4.00** Ready for Instant Use
Guaranteed Satisfactory or Money Refunded

ADAMSON MFG. COMPANY, East Palestine, Ohio

AUTOMOBILE OWNERS AND TOURISTS

should break their journey and avail themselves of the excellent facilities afforded by the D. & C. Lake Lines, operating daily service between Detroit and Buffalo and Detroit and Cleveland.

Enjoy the delights of the cool breezes from Lake Erie and resume your journey in the morning after a refreshing night's rest. Special attention given by this Company to the handling of automobiles. Rates quoted on application (state wheel base); Tanks of Automobiles must be emptied of gasoline before being shipped; three gallons of gasoline supplied free on arrival at destination.

Roads in this section of the country are in first class condition; new road now under construction between Detroit and Toledo. Tourists speak highly of the route between Buffalo and New York.

On your trip this summer bear in mind "The Waterway is The Only Way."

DETROIT & CLEVELAND NAVIGATION CO.,
General Offices, Detroit.

Standard Universal Rims



fit any style or make of tires. The side rings are reversible, they curve outward on one side to fit a straight side tire, inward on the other to accommodate a clincher. Two turns of a nut unlocks the rim for demounting, two more turns locks the rim in place. Write for catalog 607, which explains fully.



THE UNITED RIM COMPANY, Akron, Ohio

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KLAXON

EQUIPMENT

THE car manufacturer of yesterday put a certain price upon his car.

It was sold to the customer at this price.

After the sale had been made the purchaser found that in order to use the car he must go to a considerable additional expense for equipment.

After taking the first plunge—buying the car, spending the BIG amount—the customer would unwillingly, but as a matter of course, spend the SMALLER amount—for the "equipment."

Gradually, however, car competition became greater. Agents selling equipped cars found them easier to sell than those not so equipped.

Agents selling non-equipped cars found that often to make a sale they must include equipment—and at their own expense.

The manufacturer today realizes that the complete equipment policy is the broad-minded policy. That the old plan was a short-sighted one. That it was unreasonable, unbusinesslike, unjust. So does the up-to-date agent.

The manufacturer has also come to realize that by including equipment—and buying it in large quantity lots—he is able to obtain a much lower price than the agent or car user—and to give them the benefit of this price.

Throughout the automobile industry today, broad-minded, far-seeing manufacturers deliver their cars ready for use without the necessity of adding a single essential.

There is no more vital essential than an *adequate* warning signal—a signal of greater reliability and warning power than the notoriously ineffective bulb-horn. Twenty-six manufacturers include Klaxons.



KLAXONET

Lovell-McConnell Mfg Company Newark, N.J., U.S.A.

KLAXON

"The Public Safety Signal"



KLAXON

KLAXONET

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Studebaker

You Want Reasons for Putting Forward a Car

Mr. Dealer, you are a practical man, and as a practical man you want practical reasons why you should sell any type of car—you want practical reasons why you should continue selling that car.

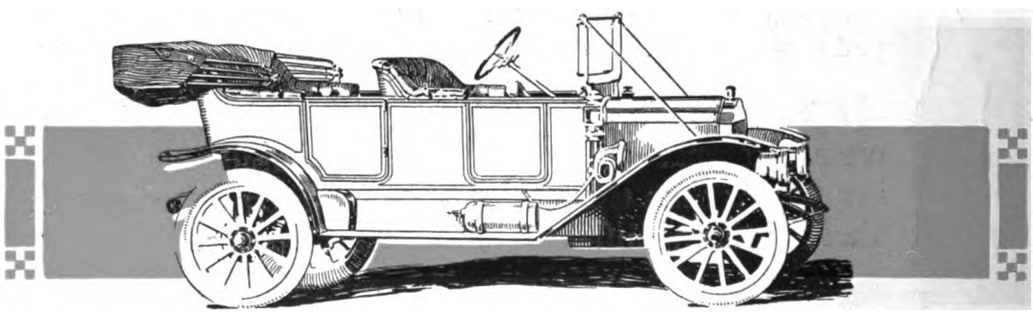
In the first place you would like to deal in cars that have the highest integrity behind them. This is a matter of plain business necessity. The Studebaker Corporation has a history of 60 successful business years. It has the stability and the reputation to back up every claim that it makes. Its name is a guarantee to you just as it is a guarantee to an owner.

You want to put your energy and enterprise into the selling of cars that will "make good." You are in business to stay and your reputation will rest on the satisfaction of owners who buy from you. The Studebaker Corporation considers satisfied owners its greatest asset. It is not content simply to have an enormous sale. It retains its interest in every Studebaker car wherever it may be in use.

You want to represent an institution big enough, buying materials on a big enough scale, to insure a moderate price for the right goods. The great Studebaker plant, its unparalleled facilities both for buying and making, give you just this guarantee.

When you represent a manufacturer you want to know that you will have co-operation. Our 36 factory branches and 2500 equipped dealers all speak for our wish for close and effective relations with dealers and customers. The establishment of this National Studebaker Service enables us to distribute supplies in the best possible way and to benefit the dealer and the owner promptly and practically.

You want to be able to make that big selling argument, a small up-keep cost, without a "come back." The light, handsome, well-made Studebaker cars are pre-eminently cars that live up to this claim. They are staunch, honest through and through, easy to operate, comfortable to ride in, comfortable to own.



The $800 Studebaker (Flanders) "20"

Equipped with Top, Windshield, Prest-O-lite Tank and Speedometer, $885 f.o.b. Detroit

STUDEBAKER CARS

(Nickel or Brass Trimmed)

STUDEBAKER (FLANDERS) "20"		STUDEBAKER (E-M-F) "30"	
Touring Car	$800	Touring Car	$1100
Roadster	750	Detachable Demi-Tonneau	1100
Utility Car	800	Roadster	1100
Delivery Car	800		

See our dealer. You can get prompt delivery. Our Art Catalog A-9 is yours for the asking.

The Studebaker Corporation Detroit, Michigan

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THE MOTOR WORLD

A Trade Paper Giving the World's Motor News

Vol. XXXII
No. 10

New York, August 29, 1912

Ten cents a copy
Two dollars a year

Are You in Line?

Is your product reaping the sales and prestige the DISCO Starter brings?

The leading cars of America are using

the "DISCO" for 1913

Such cars as

Locomobile	**Simplex**	**Marmon**	**Republic**
Pierce-Arrow	**American**	**Buick**	**Dorris**
Packard	**Marion**	**Velie**	**Pilot**
Stevens-Duryea	**Henderson**	**Jackson**	**Moon**

The motoring public demands the DISCO—they know its worth and merit. The lack of it creates "sales resistance"—an uphill fight for distribution.

Get in Line for Sales

The Disco Starter is low in price and high in efficiency. The new model "16" —the refined DISCO brought up to the highest efficiency—weighs but four pounds, has only 12 parts and is quickly applied. It sells at $30 for a four cylinder car—$35 for a six.

AGENTS AND DEALERS: There is always room in the DISCO organization for live men. Write us for open territory on the DISCO Starter and DISCO Lighter.

IGNITION STARTER COMPANY

715 Dodge Building **DETROIT, MICH.**

Published Weekly by The Motor World Publishing Company, 1600 Broadway, New York

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Helps You Meet Competition

Inclusion of the Truffault-Hartford Shock Absorber in a car's regular equipment enables both manufacturer and dealer to meet competition more successfully.

The manufacturer who equips his car with the Truffault-Hartford offers a bigger value for the money than would be possible without this unique device. This shock absorber adds to the value of any automobile because it makes a car comfortable—reduces up-keep cost—insures safety—helps an owner to get the most out of his car. The

Truffault-Hartford SHOCK ABSORBER

is now so generally recognized as absolutely necessary to a car's proper performance that 27 leading manufacturers include it as factory equipment with every car they turn out and the car YOU sell should be equipped with it.

Sold on a guaranteed-to-give-satisfaction basis, the Truffault-Hartford never fails to stand up to its work. Our generous agency terms will appeal to a progressive dealer. Write us today for details.

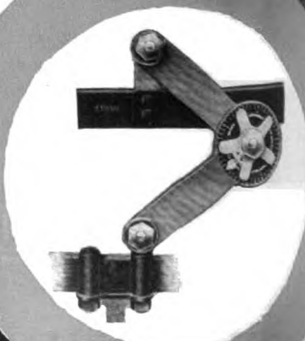
Hartford Suspension Company

EDW. V. HARTFORD, President

Factory, 164 Bay Street, Jersey City, N. J.

BRANCHES:

NEW YORK—1700 Broadway
NEW YORK—212-214 West 88th Street
JERSEY CITY—141-143 Morgan Street
BOSTON—319-325 Columbus Avenue
CHICAGO—1458 Michigan Avenue
DETROIT—803 Woodward Avenue
KANSAS CITY—1524 Grand Avenue
NEWARK—289 Halsey Street
PHILADELPHIA—1437 Vine Street
ASBURY PARK—Ocean and 3rd Avenues
INDIANAPOLIS, IND.—448-450 North Capitol Boulevard
BRETTON WOODS, N. H.—Bretton Woods Garage

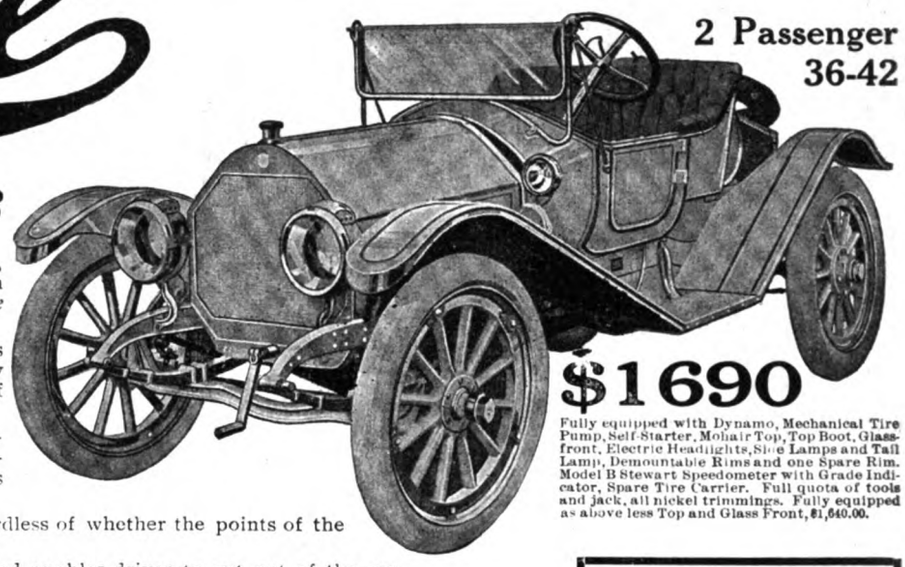


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Glide

for 1913

The wonderful success of the GLIDE is not accidental. For two generations (over thirty years) the name of its makers has stood in the very front row among the prominent manufacturers of the Great Central West.



2 Passenger 36-42

$1690

Fully equipped with Dynamo, Mechanical Tire Pump, Self-Starter, Mohair Top, Top Boot, Glass front, Electric Headlights, Side Lamps and Tail Lamp, Demountable Rims and one Spare Rim. Model B Stewart Speedometer with Grade Indicator, Spare Tire Carrier. Full quota of tools and jack, all nickel trimmings. Fully equipped as above less Top and Glass Front, $1,640.00.

NO other car gives you the up-to-date, efficient, luxurious GLIDE equipment, together with GLIDE structural quality and GLIDE *service* —at any where near the GLIDE price.

The new GLIDE Motor-Driven Tire Pump has made a big hit! Everybody wants it. Does away forever with all the tedious effort and hard work of hand pumping.

The GLIDE Automatic Dynamo *Electric Lighting* System is an up-to-date feature that appeals instantly to all. A strong talking point that makes GLIDE sales easy.

The GLIDE self-starter is *sure* of a spark, regardless of whether the points of the magneto are together or not.

The GLIDE *Center Control* is simplicity itself and enables driver to get out of the car quickly and comfortably on either side—which, together with the *left side drive* feature, is another tremendous sales-clincher.

The Lowest Priced FIRST CLASS Car On The Market

A *stronger*, more durable, better performing car is impossible. The GLIDE represents the present day *limit* of top quality in every respect.

Our low price is the result of our enormous purchasing power, our division of overhead expense, our long manufacturing experience, our superb facilities, and our willingness to take the *smallest practicable* profit in order to reach as quickly as possible the sales mark we have set for the GLIDE in every state in the Union.

Write Us At Once

in order to receive most prompt attention and forestall any possibility of disappointment later.

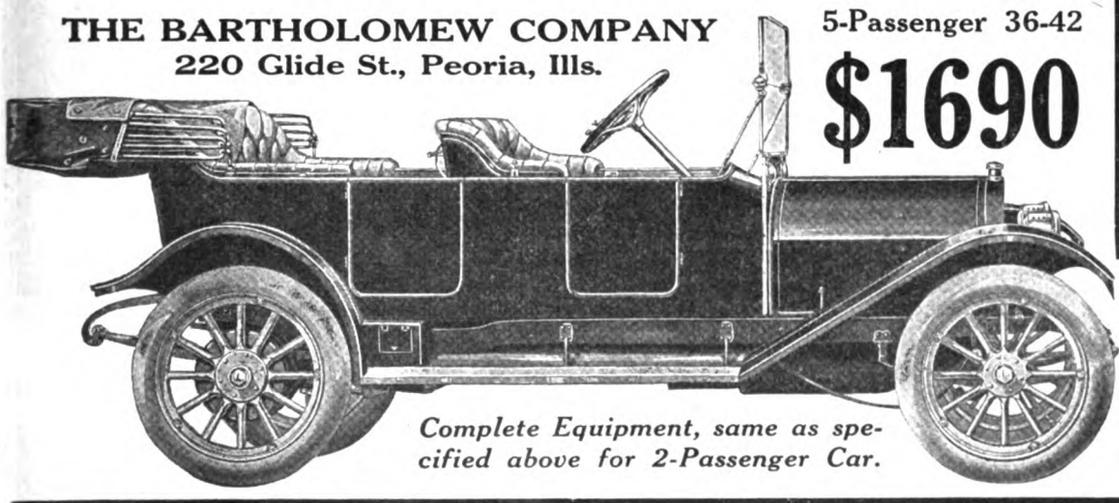
DEALERS — A GLIDE agency in your territory, which you can get *now*, (if you'll write *today*,) upon the most advantageous terms, *will be worth thousands of dollars to you and in a year or two will not then be procurable at any price!*

The GLIDE is destined to develop into one of the *fastest selling* cars on the market. Its own great value and our liberal advertising plans make this an absolute certainty. Get your local agency NOW—while the getting is good.

THE BARTHOLOMEW COMPANY
220 Glide St., Peoria, Ills.

5-Passenger 36-42

$1690



Complete Equipment, same as specified above for 2-Passenger Car.

GLIDE 36-42 FEATURES

- Automatic Dynamo Lighting System
- Motor-driven Tire Pump
- Long Stroke Motor with *enclosed valves*
- Center Control
- Left Side Drive
- Electric Side Lamps in Dash
- Electric Headlights and Tail Lamp
- An *Efficient* Self-Starter
- Floating Rear Axle with Pressed Steel Housing
- Unit Power Plant
- 118-inch Wheel Base
- Demountable Rims (Baker bolted-on)
- Goodyear No-Rim-Cut Tires

Our Complete Line

includes in addition to the two models shown here, the 45-50 in 2, 4, 5, and 7 passenger styles. *Write today* for complete specifications, circular matter, terms to Dealers, etc.

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The Niagara

Acetylene Gas and Pure Air

This is the only mixture that should enter the cylinders of your engine through the medium of an engine starter.

If pure acetylene gas be injected into the cylinders of a gas engine, it is bound to foul and soot the spark plugs and reduce the efficiency of the engine.

The Niagara Self Starter

mixes acetylene gas with the proper proportion of pure air before injecting it into the cylinders of your engine.

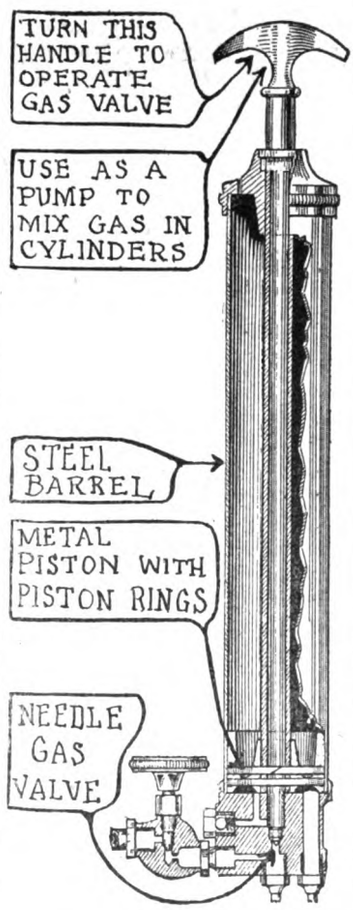
That is why the Niagara Self Starter does not soot and foul the engine plugs—

That is why the Niagara Self Starter is the one self starter that you should sell.

Not only is the Niagara Self Starter built on the proper basic principle but its manufacture and the material used in its manufacture are absolutely right.

Leather washers are dispensed with because they are inefficient. In place of leather washers the compressor of the Niagara starter, shown herewith, is made of seamless drawn steel tubing with a cast iron piston and two cast iron piston rings.

When your car is worn out, take the Niagara starter off and put it on a new car. It will last forever.



We have a splendid proposition for dealers and a manufacturing proposition that is absolutely right. Let us hear from you.

THE NIAGARA SALES COMPANY
Buffalo, New York

Self Starter

ADVERTISERS INDEX

A

Abbott Motor Car Co..... 71
Adamson Mfg Co..... 64
Ajax-Grieb Rubber Co..... 72
American Ball Bearing Co.... 58
American Motors Co..... 69
American Starter & Carburetor Mfg. Co..... 68
Argo Electric Vehicle Co..... 61
Atwater Kent Mfg. Works.... 71
Automobile Supply Mfg. Co... 36

B

Badger Brass Mfg. Co..... 68
Bantam Anti-Friction Co..... 67
Barthel, Daly & Miller..... 63
Bartholomew Co. 1
Benz Auto Import Co..... 63
Billings & Spencer Co..... 59
Bosch Magneto Co..... 63
Bossert Co. 71
Bretz Co., J. S..... 64
Briggs-Detroiter Co. 70
Brown-Lipe-Chapin Gear Co... 67
Bush Mfg. Co..... 73

C

Cadillac Motor Car Co.....46-47
Cartercar Co. 69
Champion Ignition Co..... 66
Champion Spark Plug Co..... 66
Clark-Carter Automobile Co... 71
Classified Advertising 74-75
Cole Motor Car Co..... 69
Colonial Electric Car Co..... 68
Consolidated Mfg. Co..... 68
Continental Motor Mfg. Co.... 73
Corbin Screw Corporation..... 56
Covert Motor Vehicle Co..... 51

D

Dayton Auto Truck Co..... 68
Dayton Rubber Mfg. Co..... 73
Dean Electric Co..... 40
Detroit & Cleveland Navigation Co. 64
Diamond Rubber Co..... 67
Double-Fabric Tire Co..... 60

E

Electric Welding Products Co. 67
Empire Automobile Co..... 65

F

Fedders Mfg. Works..... 66
F. I. A. T..... 68
Fireproof Garage Co..... 73
Firestone Tire & Rubber Co... 70
Ford Motor Co..... 65
Franklin Automobile Co..... 70
Fulton-McCutchan Co. 73

G

G. C. A. Mfg. Co..... 64
Goodyear Tire & Rubber Co... 71
Grant-Lees Machine Co..... 73
Grossman Co., Emil..... 39

H

Hartford Suspension Co., Inside front cover
Havers Motor Car Co..... 69
Hay[illegible]obile Co..... 68
Hodge & Graves Co..... 66
Hudson Export & Import Co.. 45
Hupp Motor Car Co..... 70
Hyatt Roller Bearing Co..... 53

I

Ignition Starter Co....Front cover
Inner Shoe Tire Co..... 72
Inter-State Automobile Co..... 65

J

J. M. Shock Absorber Co..... 61
Jackson Automobile Co..... 70
Jeffery-Dewitt Co. 64
Jencick Motor Corp..... 52
Jones & Co., Phineas..... 66
Jones Speedometer 64

K

Kellom Co., Chas. F..... 72
Kelly-Springfield Tire Co..... 59
Kinsey Mfg. Co..... 67
Kissel Motor Car Co..... 65
Kline Motor Car Corp..... 69



Digitized by Google

ADVERTISERS INDEX

Knight-Davidson Co. 70
Knox Automobile Co.....42-43

L

Lauth-Juergens Motor Car Co. 60
Leather Tire Goods Co..... 73
Locomobile Co. 72
Lovell-McConnell Co.,
Inside back cover

M

M & P Electric Vehicle Co.... 70
Marion Motor Car Co..... 38
McCue Co. 54
McGraw Tire & Rubber Co.... 73
Metz Co. 71
Michigan Motor Car Co..... 65
Michigan Crank Shaft Co..... 71
Miller, Chas. E..... 57
Minerva Hardware Mfg. Co.... 73
Mosler & Co., A. R..... 73
Moss Photo Engraving Co..... 60
Motor Car Equipment Co..... 72
Mott Wheel Works.... 64
Motz Tire & Rubber Co.....
Mutty Co., L. J..... 72

N

National-Acme Mfg. Co..... 72
National Motor Vehicle Co.... 65
New Departure Mfg. Co..... 73
Niagara Sales Co..... 2
Nordyke & Marmon Co..... 65
Nyberg Automobile Works.... 3

O

Otho Motor Co..... 71
Owen & Co., R. M..... 71

P

Packard Motor Car Co..... 76
Parish & Bingham Co..... 66
Penn Springs Works..... 73
Perfection Spring Co..... 73
Piel Co., J..... 66
Polson Mfg. Co..... 71
Prest-O-Lite Co. 71
Pullman Motor Car Co..... 37

R

R. C. H. Corporation..... 65
Regal Motor Car Co..... 48
Reliance Speedometer 50
Remy Electric Co..... 62
Republic Rubber Co..... 67
Royal Equipment Co..... 67
Rutenber Motor Co..... 69
Rhineland Machine Works..... 45

S

Schrader's Sons, A., Inc..... 62
Shawmut Tire Co..... 68
Sheldon Axle Co..... 41
Smith Co., A. O..... 67
Sparks-Withington Co. 57
Speedwell Motor Car Co..... 70
Splitdorf Electrical Co..... 66
Springfield Metal Body Co.... 71
Standard Roller Bearing Co.... 72
Standard Welding Co..... 55
Stearns Co., F. B..... 69
Stewart Motor Corporation.... 35
Streator Motor Car Co..... 69
Studebaker Corporation. Back cover

T

Timken-Detroit Axle Co..... 49
Tobias, F. H..... 73
Twitchell Gauge Co..... 56

U

United Rim Co..... 64
United States Tire Co..... 73

V

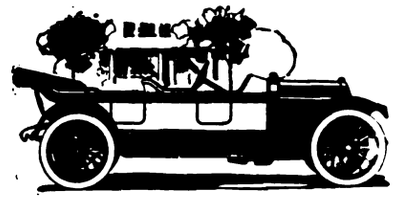
Valentine Co., J. H..... 62
Volkmar Auto Starter Co..... 63

W

Warm Hand Steering Wheel Co. 44
Warner Gear Co..... 61
Warner Instrument Co..... 61
Weed Chain Tire Grip Co..... 72
Willard Storage Battery Co.... 71
Willys-Overland Co. 4
Wisconsin Motor Mfg. Co..... 63
Woodstock Hotel 60

Nyberg

Sixes



Have so many valuable features that an intelligent comparison of these cars with others will quickly prove the Nyberg superiority.

Nyberg Six-45 . . . $1750
Nyberg Six-60 . . . 2000
Nyberg Four-40 . . 1450
Nyberg Four-37 . . 1295

Nyberg Automobile Works
ANDERSON, INDIANA
Chicago, Ills. **Chattanooga, Tenn.**

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Overland 1913

$985

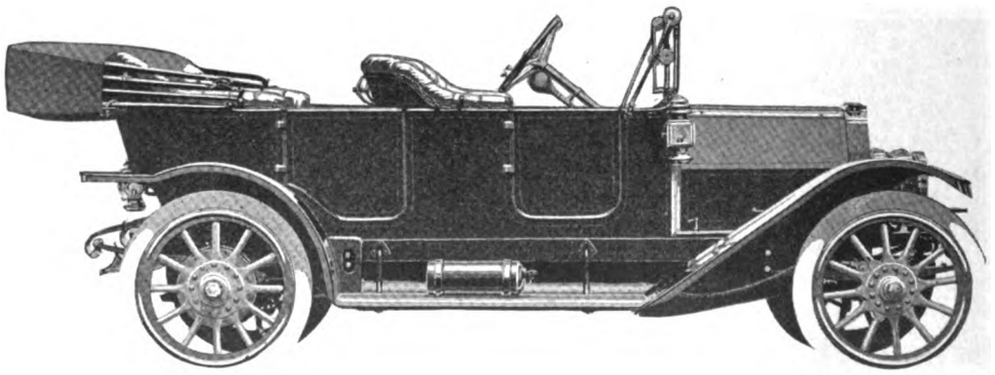
Completely Equipped

Consider This Car's Features

Self Starter	*Remy Magneto*
30 Horsepower	*Warner Speedometer*
5-Passenger Touring Car	*Mohair Top and Boot*
110-inch Wheel Base	*Clear Vision Wind Shield*
Timken Bearings	*Prestolite Tank*
Center Control	

¶ There is our proposition in black and white. Read it; study it; compare it. We need make no blustering statements. It is a bargain every dealer and prospective purchaser in the country must appreciate. Talk to any of the 23,000 owners of 1912 Overland cars. Hear their praises. Buying materials for 40,000 cars at bottom prices, only, makes this Overland Model 69 T value possible. A 1913 catalogue gives full particulars. Ask for book I-48.

The Willys-Overland Company, Toledo, Ohio



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THE MOTOR WORLD

Vol. XXXII New York, U. S. A., Thursday, August 29, 1912 No. 10

ARISTOS RETURNS DISCO ATTACK

New Yorkers Bring Countersuit Asking for $304,000—Complaint Enumerates Long List of Alleged Derelictions

Differences between the Ignition Starter Co., of Detroit, maker of the Disco starter, and the Aristos Co., of New York, which handled the Disco device in the eastern part of the country, which reached a climax early this month when the Detroit company resorted to law, have assumed a razor edge. While the Disco company's action, filed in the Supreme Court in New York, claims $43,000, the Aristos Co. has responded with a countersuit, instituted in the Federal Court in Detroit, for no less than $304,000, the papers in the case making plain that all semblance of love between the once friendly parties has been wholly and disagreeably dissipated.

In its suit, the Ignition Starter Co. alleged that its former eastern representatives owed some $13,000 for goods delivered and not paid for, and that it signally failed to prosecute the sale of Disco starters and otherwise committed serious lapses. The Aristos Co. now retorts that the trouble was due to the Disco device itself. In its complaint, it declares that Disco distributers were plugged, that valves leaked and that practically each and every part of the Disco starter was so lacking that, if true, the wonder is how the Disco people ever attained their present enviable position. Because of these alleged failures on the part of the device itself, the Aristos Co. claims that it has been damaged to the extent of $100,000, which forms the chief item in its suit, which set up seven different causes of action.

The balance of the $304,000 for which action has been brought is made up of claims for (1) $75,000 for failure to render promised mechanical and technical services; (2) $75,000 for notifying the Aristos agents that the Aristos Co. no longer had the right to sell Disco starters; (3) $25,000 for alleged invasion of its territory; (4) $15,000 for alleged failure to pay a commission of 10 per cent. on receipts from manufacturers outside of its territory but secured by the Aristos Co.; (5) $10,000 for wrongful termination of the contract existing between the contending parties; (6) $4,000 for refusal to take back and give credit for some 200 starters which remained on the Aristos company's hands.

Veitch Abandons Projected Dayton Plant.

The Veitch Motor Mfg. Co., which was organized under New York laws and which secured a site in Dayton, O., where it purposed manufacturing engines and other parts, and ultimately cars, has abandoned its intentions in that direction, at least, because of disagreements which arose among those most interested. As a direct result of these internal troubles, Harry I. Schenck and Harry J. Williams, architects in Dayton, who were employed to draw plans for the Veitch factory, have filed suit for $1,183, which amount covers expenses incurred and the commission which they would have obtained had the factory been constructed. J. S. Harris, of Jersey City, N. J., is president of the company, which, according to a recent Dayton story, was to be financed by William G. Rockefeller.

Big Canadian Sales Company Discontinues.

The Rubber Tire Wheel Company Agency, of Toronto, which for many years marketed the tire productions of the Gutta Percha & Rubber Mfg. Co., of that city, including licensed Fisk tires and Kelly-Springfield carriage and truck tires, has discontinued business. The Gutta Percha company itself hereafter will not only manufacture its tires but market them direct to the trade.

Studebaker Manager Goes Globe-Girdling.

L. L. Halle, manager of the Studebaker Corporation's export department, sailed last week for a trip around the world in the Studebaker interests. He will be absent about five months and will spend considerable time, particularly in the far Eastern markets.

THREE-POINT PATENT LOOMS UP

Owners of Huber Invention Inaugurate Campaign of Litigation—Packard and Havers Take Out Licenses.

Although the recognition of the Dyer sliding gear patents by the Automobile Board of Trade has placed a large portion of the trade on safe ground, where it will be free from threats of litigation on that score, still another patent, also of wide scope, is being brought to bear and from a wholly different direction. It is the Emil Huber patent, No. 88,407, of date April 25, 1905, which is claimed to cover all forms of three-point suspension of the main frame and to affect also many of the unit power plants in use.

The patent is owned by the North American Vehicle Co., of Detroit, which is purely a patent-operating company, and the fact that it had brought the Huber patent to bear and had conveyed warning to a considerable portion of the trade was exclusively published in the Motor World of December 21st last. That the Huber interests actually had taken their claims to court, however, was not generally known until last week, when suit was instituted in the Federal Court in Bay City, Mich., against the Alpena Motor Car Co., of Alpena, Mich., which latter is charged with infringing the Huber patent and an injunction and accounting is prayed for.

Investigation of the matter, however, disclosed that the Alpena action is not the first which had been instituted, as it develops that in April last a similar suit had been brought against the Havers Motor Car Co., of Port Huron, Mich, which suit was discontinued on July 30th, when the Havers company recognized the Huber patent and obtained a license to operate under its provisions. There is also pending a suit for infringement against the Detroit Taxicab & Transfer Co., which was filed early last month.

Probably the most surprising develop-

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ment of the inquiry which the Motor World instituted, however, is the fact that such an important company as the Packard Motor Car Co. has deemed the Havers patent of such value that it has recognized it and taken out a license.

In addition to Packard and the Havers company, the Case Motor Truck Co. also has been granted a Huber license, the fee for which is $1 per thousand dollars of catalog selling price, and the owners of the patent state that they hardly have begun their fight and that litigation all along the line is being prepared.

The officers of the North American Vehicle Co., which operates the Huber patent, are: Henry G. Ide, president; J. Emmet Sullivan, vice-president, and Thomas J. Clinton, secretary. Sullivan is a Detroit attorney, and in prosecuting the Huber claims he is being assisted by R. A. Parker, of Parker & Burton, the Detroit attorney, who for a time represented Ford in the momentous Selden patent litigation.

Summarized, the North American company claims that the Huber patent covers "any driving mechanism of an automobile wherein the parts that go to make up the same are brought together in what is termed a unit power plant, suspended at three points upon the main frame, and wherein one of the points forming the triangle is arranged to swivel."

In presenting Huber's case, Attorney Sullivan cites three earlier patents, issued respectively to T. French, January 9, 1900, to A. B. Fowler, January , 1902, and to Paul Paul Synnestwedt, February 18, 1902, all of which he asserts "are purely axle propositions for the support or suspension of the sub-frame." All were lacking in practicability, he contends, and it was Huber who solved the problem by "suspending the sub-frame carrying the driving mechanism on the main frame" by three points, one of which as adapted to swivel.

Brown to Take up his Own Truck.

Despite belief that Will H. Brown, former president of the Mais Motor Truck Co., of Indianapolis, which last week was succeeded by a new million dollar corporation of the same name, would remain as general manager of the organization, such will not be the case. He has entirely disassociated himself from Mais affairs and will become president and general manager of the Brown Commercial Car Co., which he recently assisted in organizing in Peru, Ind., of which Carl H. Wallerich, Brown's former chief lieutenant in the old Mais company, has been serving as general manager. When Brown assumes the general managementi Wallerich will remain his chief aid. While the Brown truck will be made in Peru, its general offices and sales offices will be located in Indianapolis. The vehicle itself is well in hand. It will be of 1,500 pounds capacity, have a wheelbase of 122 inches and will utilize a Continental four-cylinder, long-stroke motor. The initial output will be 500 cars.

THOMAS AFFAIRS NEAR TO CLIMAX

Creditors' Committee Will Decide Fate of Company on Monday Next—Old Debt Proves Heavy Burden.

Although it appeared likely that the troubles which had beset the E. R. Thomas Motor Car Co., of Buffalo, N. Y., would be known no more, when, about a year ago, E. R. Thomas stepped out and, with the assistance of a strong creditors' committee, the company was reorganized and new money, represented by Eugene Meyer, the New York banker, was put into it, the old money stringency did not cease. In fact, the big debt which the new owners assumed proved a trying load. It amounted to $600,000, of which all but about $250,000 has been paid, not including a personal note for $210,000 held by E. R. Thomas himself for money advanced on his own account to assist the original company.

The Meyer interests have had other burdens to carry and the fact has not made the Thomas way easier. In fact, when a note for $120,000 fell due on the 1st inst., it was only by a grace of the creditors' committee that an extension was secured. Since that time several minor judgments have been secured against the Thomas company, all of which, however, have been settled, but the situation has plainly indicated that affairs were reaching a climax, and on Monday next, September 2nd, the fate of the company probably will be settled for all time.

Theer is friction between the merchandise creditors and others who hold the notes, several of whom, it is stated, are seeking payment ahead of the others, and generally the conditions are such that it is not impossible that the creditors' committee, which meets on Monday next, may recommend that action of a most drastic nature be taken.

The Thomas office force still is at work but the factory practically is shut down. There are only a few mechanics at work there and it is understood that pending the action of the creditors' committee orders for a large quantity of material have been held up. The Meyer interests, it is understood, are not keen for operating the plant at a loss.

Frederick R. Humpage, the president of the company, who some three weeks since stated that he held an option on the Thomas plant and that he could secure ample capital to continue and swing the business, is understood to be in conference with financial men and creditors, while at the same time reports from a Thomas source say that he has tendered his resignation as president and is to become affiliated with the Utility Tri-Car Co., of Buffalo. Humpage, however, can not be reached, and his exact plans, therefore, can not be learned, but present indication make appear that he is not likely to exercise the option which he is credited with holding.

Swinehart to Distribute Treasury Stock.

Stockholders of the Swinehart Tire & Rubber Co. of Akron, O., are being offered at par $150,000 of the company's treasury stock, in the proportion of 23 per cent. of their respective holdings, subject to the approval of the annual meeting of the stockholders on September 25. The company states that this action is made necessary by its inability to take care of the volume of business with its present capital. Subscriptions must be on file with the company on or before September 7, and full payment made on or before September 14. Swinehart stock has been quoted below par several times recently. The company lately reduced the quarterly dividend from 2 to 1½ per cent. to assist the financing of the large volume of business offered.

Seattle Contributes Jewell Carburetter.

The Jewell Carburetter Co., which has been organized in Seattle, Wash., will manufacture a carburetter invented by Samuel Jewell, who is president of the enterprise, and which represents the result of six years' experiment. M. M. Arant is vice-president of the company and R. W. A. Simmons, a Seattle stock broker, is secretary and treasurer. The device itself will be made in Detroit, Mich., but it will be marketed from the Jewell office in the White building in Seattle. It is claimed absolutely to eliminate smoke and smell and to be proof against back firing, freezing and choking.

Weed Enjoins Another New York Dealer.

As a result of the application filed three weeks ago by the Weed Chain Tire Grip Co. in the United States District Court for the Southern District of New York against Joseph A. Del Solar, an accessory dealer of 80 Warren street, New York, to restrain De Solar from selling the Perry and Peerless grip, which, it is alleged, infringe the Parsons patent No. 723,299, that court this week issued a preliminary injunction which serves to "tie up" Del Solar until the case is tried. Del Solar appeared in person but did not oppose the action.

Rochet-Schneider Seeks Canadian Favor.

The Rochet-Schneider car, which at one time was fairly well known in the United States, is now making a bid for Canadian favor, the Rochet-Schneider company, which is located in Lyons, France, having established a branch in Montreal. Julien Chatel is in charge.

Making Leather Tread Tires in Montreal.

The Fearless Tire Co. of Canada has been organized in Montreal by J. W. Baillargeon, president of the Auto Bus Co., and J. A. Michaud, of the Vinot Car Co. of Canada; it will manufacture a leather tread steel studded tire, operations already having commenced.

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KING COMPANY TO BE REORGANIZED

Three Creditors Present an Obstacle, Which, However, Will Not Halt Plans —1913 Output is Practically Sold.

Despite the fact that plans for reorganization are well under way, and that they contain every promise that the company will be placed on a better basis than ever before, three creditors on Tuesday last, 27th inst., filed a petition in bankruptcy against the King Motor Car Co., of Detroit. They are A. Harvey's Son Mfg. Co., Charles R. Strelinger Co. and the Wolverine Motor Supplies Co.

While the bankruptcy proceedings, which were instituted in the Federal court in Detroit may slightly aggravate matters, it is not believed that they will in any way halt or seriously interfere with the reorganization plans. The King company produces an uncommonly attractive car and it is understood that its entire output for 1913 already has been contracted for, but despite the fact a combination of somewhat unusual circumstances, coupled with the failure of certain men to rise to the occasion, served to hinder the complete success which was and is within easy reach. The responsible men of the King company, however, are keenly alive to the opportunity, and as they have assumed actual direction there is every reason to believe that a greater King company will evolve from the present flurry.

Reproducing French Car in Canada.

The Montreal Automobile Carriage Co. has been formed in the Canadian city of that name for the purpose of building automobiles under contract. It already has secured the order to build the Vinot car, the Canadian interests in which are controlled by the Vinot Car Co. of Canada, which recently was organized and with which officers of the Auto Taxi Cab Co. and the Auto Bus Co. are prominently identified. It is stated that both the chassis and body of the Vinot car will be manufactured in their entirety in Montreal, and that orders from the Taxi Cab and Auto Bus companies of themselves are sufficient to assure the success of the enterprise, which will be manned by workmen brought from the Vinot factory in France.

"35%" Claims Bankruptcy Broke Contract.

That by going into bankruptcy, whereby shipments of goods were halted, the American Pedal Co., which formerly had its principal place of business in New York City, broke its contract with the 35 Per Cent. Automobile Co., is the more or less novel counter claim instituted by the latter company in answer to an action brought by the Personalty Liquidating Co., which is suing for $965 alleged to be due on an account dating back two years. The Personalty Liquidating Co., which bought up the claims of the American Pedal Co., brought suit in the City Court of New York, asking for the amount involved and interest, together with costs, alleging that the amount involved is due for goods in the shape of special pedal grips which were delivered to the defendant, but the "35 per centers" claim they did not receive all they contracted for and therefore dispute payment.

"Surplus" Stock Syndicate Enjoined.

William Wooster, of New York City, who prefers to trade under the fanciful title Automobile Surplus Stock Syndicate, has promised to be good and sin no more, so far as Spitfire spark plugs are concerned. In order to assure such goodness on his part, however, a permanent injunction restraining him from cutting the price of the Spitfire plug was entered in the United States District Court for the Southern District of New York on Monday last, 26th inst. A. R. Mosler & Co., makers of the Spitfire, previously had obtained a temporary injunction, and in view of the fact that Wooster did not oppose the granting of the permanent decree, they waived all claims for damages and adjusted the costs satisfactorily.

Timken Erecting Model Grinding Shop.

The Timken Roller Bearing Co. is adding to its plant in Canton, O., what is claimed will be the most modern grinding shop in the world. The new building will be 64 x 240 feet, of saw-tooth roof and steel frame construction and solid concrete floors. In the winter, it will be heated by the blower system, all pipes being under ground; in the summer, the heating system will be utilized to circulate cold air. New machinery to grind the Timken cups, cones and rolls will be installed, and in every respect the equipment will be as complete and modern as capital and human ingenuity can secure. The building will be occupied Nov. 1st.

Embarrassed Henry Discloses Creditors.

Schedules in bankruptcy of the Henry Mfg. Co., of New York, maker of Blitzen engine starters, who failed some four weeks ago, show liabilities of $5,936 and assets of $1,465, consisting of accounts, $1,282, and cash in bank, $183. Among the creditors are Edward Schroeder, lamp works, Jersey City, $1,065; Barney Estate Company, $416; F. L. Hutton, $750; Sterling Postley, $750; Edward E. B. Adams, $450, and George A. Ellis, Jr.

Judgement Against Peekskill Garageman.

Charging that William H. Ash, who conducts a garage and supply business at Peekskill, N. Y., failed to settle for tires and tubes sold and delivered to him, the Thermoid Rubber Co., of New York City, brought suit in the Supreme Court for New York County and on Monday last obtained judgment. The amount of the bill was $122.55, but costs brought the judgment to $144.47.

URGES DEALERS TO BE BILLY GOATS

"Let's Use our Horns on Manufacturers," says Zacharias—Trenchantly Discusses Wants and Needs of Retailers.

Ask the average manufacturer what the average dealer most desires and the chances are strong that he, laconically, will answer, "The earth."

Ask the dealer the same question and he will declare that he merely wants a comparatively small part of the earth.

That there are more than a few dealers who believe that they are not getting a fair share of it is fairly well known. They believe that the manufacturer gets all the best of it and that agency contracts, as they exist to-day, are too one-sided. The dealer is prone to consider himself the "goat" of the industry, but "if we must be 'goats,' let us be 'billy goats' and use our horns to better our condition" is the language used by one of the agents, whose experience and whose capacity as a thinker is undoubted, and who probably rates as above the average. He is C. R. Zacharias, president of the Zacharias Garage Co., of Asbury Park, N. J., and Zacharias's picturesque expression is contained in a letter which he has addressed to a number of fellow-dealers with a view to bettering their mutual condition, specific suggestions to which end he offers. He advises that they consider them before signing contracts for 1913. These suggestions are as follows:

First—Discount on cars and equipments 20 per cent., 25 per cent. or 30 per cent., according to quantity.

Second—Discount on parts 33⅓ to 40 per cent. and all orders from his town referred to local agents.

Third—Demonstrating cars and cars to be used for hiring at factory cost.

Fourth—The dealer to deposit $25 on each car ordered, which he forfeits in the event of his not taking the car. (Excepting as provided for section 7.)

Fifth—The manufacturer agrees to pay the dealer his commission on any cars not delivered as per contract, except the failure is due to fire or accident that would cripple the plant. The same exemption being granted the dealer.

Sixth—The dealer agrees to accumulate a stock of 10 per cent. to 15 per cent. of his contract for new cars in addition to his demonstrating and rental cars.

Seventh—The dealer has the privilege of canceling any car or cars that may be due him any time he has his 10 per cent. or 15 per cent. of new cars in stock, in addition to his demonstrating and rental cars.

Eighth—The manufacturer agreeing to give us a three to five year contract.

Ninth—We to have one-half commissions on cars delivered in our territory within 30 days of sale being made, said commissions

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to be paid by the factory and deduced from account of agent who makes the encroachment.

Tenth—Make commissions retroactive; others give 20 to 30 per cent.

Eleventh—The tires we use on demonstrating cars to be furnished by tire makers at factory cost.

As a sort of postscript to the suggestions, Zacharias quotes from Roosevelt's Boston speech: "I don't want to see all the profit of production stop at the factory door. It ought to pass along, some of it, to the workers."

Zacharias himself is no fledgling. What hair fringes his "polished dome of thought" is white, but for all of that he is charged with real energy and uncommonly full of ideas, which are reflected in an uncommonly complete establishment, which at this time gives employment to 77 persons. It comprises a garage, with a capacity for 180 cars, a repair shop, a supply department and a salesroom and office. They are not of the every-day sort, and evidence of Zacharias's ideas are everywhere apparent.

Zacharias is firm in the belief, as his suggestions indicate, that the dealer, particularly in the small town, is not obtaining a fair share of the industry's prosperity.

"At best," he said to a Motor World man, "dealers in towns of this size are doing well if they sell half a dozen cars each year, and we'd starve if we depended solely on the sale of cars; most of us earn more on the sale of gasolene; but let we tell you that the item of depreciation on their demonstration cars alone is sufficient practically to wipe out the profit of 15 or 18 per cent. which is accorded dealers by manufacturers. Being located in a summer resort, I myself am able to use my demonstration cars after they have served that purpose for rental use and in that way am able to do better than dealers less favorably situated. But the loss on demonstrators is real, and earnest, and heavy; it eats up most of our profits. So far as I am concerned, I will not handle automobiles another year unless I am accorded discounts better than those which now prevail.

"Why shouldn't we obtain better figures?" he went on. "Not all of us are blind, and we can see the evidences of huge profits and enormous wealth amassed by many of the manufacturers, which points to a one-sided state of affairs. I do not believe that I am overstating the case when I say that the dealers of this country have furnished capital sufficient to start more than one of the now big automobile manufacturers on the road to fortune simply by giving up deposits on cars which never were delivered and, in my opinion, never were intended to be delivered, in certain cases. This deposit system, even as it now operates, operates against the dealer. It is no guarantee that he will receive the car or cars which his deposit covers and which, in many instances, have been sold and in which the failure to deliver means the loss also of the commission on the sale.

"And in the matter of demonstration cars, quite apart from the matter of discounts, why are we not entitled to a special price? We are making business for the manufacturer while we are making it for ourselves, but the making is wholly at our expense. In the heyday of the bicycle, I sold Columbia bicycles, and Col. Albert A. Pope, who made them, recognized the justice of a somewhat similar condition. We taught people how to ride without cost, and here in Asbury Park we maintained a line of rental wheels. It is a matter of history and of logic that the first wheel used by a man or woman lingers in his or her mind and, as a result, many of those who rented Columbias while sojourning in Asbury Park purchased Columbias when they returned home or went elsewhere. Thus, as dealers, we made sales for the Columbia factory. Col. Pope was fair enough to admit it, and on the stock of rental wheels which we carried he gave us a special discount of 40 per cent., subject only to the condition that these rental machines should not be disposed of previous to September 1st. I am not sure, but perhaps 40 per cent. is too much to expect on a motor car, but certainly it is not too much to ask a special price on cars used for demonstration purposes, even though similar conditions might be attached.

"What I have said about cars largely applies to parts also. A discount of 10 per cent. on parts is neither fair nor profitable; and, will you believe it?" almost ejaculated the earnest Zacharias, "I had one prominent manufacturer of a light truck actually offer me a discount of 2 per cent. on parts. The offer decided me against taking the agency for his truck.

"We should have greater protection, too," he continued. "It isn't fair—in fact, it scarcely seems honest—that cars which we represent and which have been purchased elsewhere should be brought into our town. But as it is as fair for one as for the other, if a dealer in one place feels that he cannot afford to risk the loss of a sale made to a resident outside his territory he should at least be willing to share his commission with the agent to whom the sale rightfully belongs, and in all decency the manufacturer should insist that it be done. More, I believe that this policy of protection should be carried even further: When an agent has built up a demand for a particular car it is not right that opportunity should exist for taking the agency away from him at the end of a year; he should be protected by long time contracts that will cover periods of three, or four, or five years.

"These are my beliefs, at any rate," concluded Zacharias, "and I know that they are shared by others. I believe that if a sufficient number of dealers will take a sufficiently firm stand we will obtain more of what I truly believe to be our due, if not our rights. As it is, and as I have said in my circular letter offering suggestions along these lines, the dealer is the 'goat' and I am firm in the belief that we should be billy goats and use our horns on the manufacturers. We need the manufacturers, of course, but they need us quite as much as we need them."

Goodrich Shares on New York Exchange.

After having been traded on the New York curb market for a considerable period, the shares of the B. F. Goodrich Co. have been recognized by the New York Stock Exchange and were approved for listing on Tuesday last. The issue listed comprises $3,000,000 7 per cent. cumulative preferred stock and $6,000,000 common stock.

As reported to the stock exchange, the combined earnings for the past four years of the B. F. Goodrich Co. and the Diamond Rubber Co, which it absorbed in April last, are as follows:

	1911	1910	1909
Gross sales.....	$48,528,112	$45,899,535	$32,087,854
Profits	7,805,312	6,384,059	8,063,146

These profits are after charging all expenses of manufacturing and management and selling expenses but before providing for depreciation of property and plant. The earnings include in each instance the operations of the Goodrich company for the calendar year and of the Diamond company for the fiscal year ending September 30.

Small Judgment Clouds a Tall Title.

Despite its high sounding name, the Roller Bearing Co. of America, which named Washington as its principal place of business, evidently found difficulty in doing all that it set out to do. At any rate, judgment against it for the trifling sum of $47.48, in favor of F. J. Bernard, was entered this week in the New York Supreme Court. Bernard is a machinist and maker of models and mechanical devices at 70 Murray street, New York, and the judgment represents a bill for materials and labor during July, 1911, for which he received no payment. The New York Telephone Co. also took judgment against the Roller Bearing company, which, notwithstanding its tall title, failed to figure in the automobile trade.

Standard Truck Coming from Detroit.

With Howard Wilcox, who previously was identified with the Kelsey Wheel Co., and W. K. Ackerman, former assistant manager and purchasing agent of the Reliance Motor Truck Co., as prime movers, the Standard Motor Truck Co., capitalized at $50,000, has been organized in Detroit. It already has secured a concrete factory, 35 x 140 feet, at 973 Bellevue avenue, in Detroit, and will at once proceed to the manufacture of a 3-ton truck which will utilize a Continental motor.

Taximeter Company Files Schedules.

The Mutual Taximeter Cab Co. of 249 West 80th street, New York City, this week filed schedules in bankruptcy in the Federal court; the liabilities total $43,191.09 and the principal assets are open accounts to the amount of $1,393.35. The petition in bankruptcy was filed last month.

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THE WEEK'S INCORPORATIONS




Jersey City, N. J.—Ideal Auto Co., under New Jersey laws; to deal in motor cars.

Portland, Ore.—Snodgrass-La Chance Auto Co., under Oregon laws, with $5,000 capital; to deal in motor cars.

New Castle, Pa.—Lawrence Automobile Co., under Pennsylvania laws, with $40,000 capital; to deal in motor cars.

Tampa, Fla.—West Coast Auto Co., under Florida laws, with $25,000 capital; to deal in motor cars. Corporators—Victor A. James and others.

Dayton, Fla.—Pneu Tire Filler Co., under Florida laws, with $5,000 capital; to manufacture tire filler. Corporators—V. G. Collins, Elmer Oliver, E. F. Oates.

San Antonio, Tex.—Guarantee Motor Car Co., under Texas laws, with $10,000 capital; to deal in motor cars. Corporators—J. F. Hagan, H. J. Smith, C. W. Voss.

Fresno, Cal.—E. W. Johnson Co., under California laws, with $7,000 capital; to deal in motor cars. Corporators—E. W. Johnson, H. M. Johnson and others.

Charlotte, N. C.—Model Garage, under North Carolina laws, with $25,000 capital; to operate a garage. Corporators—R. F. Price, E. J. Jones, R. B. Cochrane.

Anderson, Ind.—Hill-Stage Co., under Indiana laws, with $5,000 capital; to manufacture motor car devices. Corporators—Hugh Forest, E. N. Hill, H. C. Stage.

Boston, Mass.—Fenway Garage Co., under Massachusetts laws, with $250,000 capital; to operate a garage. Corporators—Josiah C. Cannon, Chester W. Engle.

Durham, N. C.—E. B. Lyon Motor Co., under North Carolina laws, with $50,000 capital; to deal in motor cars. Corporators—E. B. Lyon, J. E. Johnson and others.

Omaha, Neb.—Western Auto Sales and Mfg. Co., under Nebraska laws, with $50,000 capital; to deal in motor cars. Corporators—A. W. Gilman, M. M. Seales and others.

Boston, Mass.—E. C. Andrews Co., under Massachusetts laws, with $40,000 capital; to deal in motor cars. Corporators—Everett C. Andrews, H. Russell Lynn and others.

Union Hill, N. J.—Clinton Automobile Co., under New Jersey laws, with $10,000 capital; to deal in motor cars. Corporators—B. H. Krom, W. A. Schuette and others.

Cedarburg, Wis.—A. J. Meyer Motor Car Co., under Wisconsin laws, with $25,000 capital; to deal in motor cars. Corporators—John Armbruster, Jacob Dietrich and others.

Cortland, N. Y.—Brockway Motor Truck Co., under New York laws, with $100,000 capital; to manufacture motor trucks. Corporators—George A. Brockway, Charles S. Pomeroy, Ferderick R. Thompson, all of Homer.

Hempstead, N. Y.—Smith's Garage, Inc., under New York laws, with $2,000 capital; to operate a garage. Corporators—Lawrence Schultz, Joseph Pensock, Ray McCombs.

Akron, Ohio.—Dutch Rubber Co., under Ohio laws, with $1,250,000 capital; to manufacture motor car tires. Corporators—E. L. Schnee, U. R. Grant, I. A. Grant, F. E. Sherman.

St. Joseph, Mo.—Ardery-Holliday Motor Car Co., under Missouri laws, with $10,000 capital; to deal in motor cars. Corporators—J. W. Ardery, J. W. Holliday, Jr., W. S. Thompson.

Little Rock, Ark.—Travelers' Sales Co., under Arkansas laws, with $10,000 capital; to deal in motor cars. Corporators—S. R. Thomas, L. K. Duncan, H. B. Martin, Austin Fuller.

Kansas City, Mo.—Packard Kansas City Motor Co., under Missouri laws, with $2,000 capital; to deal in motor cars. Corporators — Joseph B. Renshaw, Robert Sloan, R. J. Ingram.

Elizabeth, N. J.—Franklin Auto Co., under New Jersey laws, with $10,000 capital; to deal in motor cars. Corporators—William H. Reynolds, Jr., William H. Reynolds, Sr., and others.

Cleveland, Ohio.—South End Garage Co., under Ohio laws, with $5,000 capital; to operate a garage. Corporators—A. Haskin, H. Lewis Mock, H. Sadugar, J. E. McNemar, J. Goldstein.

Boston, Mass.—Standard Auto Supply Co., under Massachusetts laws, with $100,000 capital; to deal in motor car supplies. Corporators — Michael F. Culliney, Edith W. Shepherd and others.

Chicago, Ill.—M. R. L. Resilient Tire Co., under Illinois laws, with $100,000 capital; to manufacture and deal in motor car tires. Corporators—Mitchell R. Labbee, Martin O. Lundholm, B. Wilson More.

Akron, Ohio—Marathon Tire & Rubber Co., under Ohio laws, with $10,000 capital; to manufacture tires. Corporators—Ellis R. Diehm, C. C. Owens, Sterling Newell, Donald McBride, H. J. Crawford.

New York, N. Y.—Fox-Hegyi Co., under New York laws, with $6,000 capital; to repair and paint motor cars. Corporators—Arthur Fox, 281 West 150th street; Otto Hegyi, both of 930 East 180th street.

Columbus, Ohio.—Engle & Vincent Automobile Co., under Ohio laws, with $15,000 capital; to deal in motor cars. Corporators—Charles H. Engle, G. A. Marquardt, Frank L. Vincent, Charles W. Engle, John K. Henry.

Baldwin, N. Y.—Acme Auto Rental Co., under New York laws, with $5,000 capital; to conduct an automobile livery. Corporators—George Wintjen, Adam Meiselbach, both of Freeport; Allen C. Ewing, Baldwin.

New York, N. Y.—Henderson Eastern Motors Co., under New York laws, with $20,000 capital; to deal in motor cars. Corporators—Harry Harris, E. Knight Harris, Leopold Friedman, all of 31 Nassau street.

New York, N. Y.—North River Garage, Inc., under New York laws, with $20,000 capital; to operate a garage. Corporators—W. E. Lockwood, 52 Broadway; Leonard E. Jelly, Robert E. Shaw, both of 556 West 27th street.

New York, N. Y.—New York Electric Vehicle Association, Inc., under New York laws, with $50,000 capital; to deal in motor cars. Corporators—George Tiernan, Frank H. Parcells, Robert G. Reblefsen, all of 54 Wall street.

Brooklyn, N. Y.—Greenpoint Tire Repair Co., under New York laws, with $10,000 capital; to repair tires, etc. Corporators—Charles E. Keller, 2 Jewell street; Anna Kovacs, John Kovacs, Jr., both of 36 Grand street.

New York, N. Y.—Reliance Taxicab Co., under New York laws, with $500 capital; to operate taxicabs. Corporators—Nicholas F. Yeagle, Elizabeth Yeagle, both of 516 West 136th street; Katherine Lally, 175 West 72nd street.

Hamilton, Ohio.—Ideal Steel Wheel Co., under Ohio laws, with $500,000 capital; to manufacture spring wheels for motor vehicles. Corporators—J. E. Strietelmeier, A. F. Parker, D. E. Kirgan, Walter C. Taylor, James B. O'Donnel'.

New York, N. Y.—Volkmar Mfg. Co., under New York laws, with $100,000 capital; to manufacture motor starters. Corporators—Bernhard Volkmar, 725 Eagle avenue; Edward Giegerich, William H. Giegerich, both of 1218 Tinton avenue.

New York, N. Y.—Tredvent Tire Co., under New York laws, with $100,000 capital; to manufacture motor car tires. Corporators—Nathan A. Sterling, David A. Sterling, both of 126 West 112th street; Samuel Bing, 1451 Eastern Parkway, Brooklyn; Morris Rachmil, 403 East 99th street; Louis Cantor, 362 Sackman street.

Changes in Corporate Names.

Dayton, Ohio—Nation Automobile Co. to Majestic Motor Car Co.

Youngstown, Ohio—Household Rubber Co. to Auto Rubber and Cycle Supply Co.

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RECORD ORDERS ALREADY BOOKED

Jeffery and Overland Report Remarkable Demand—Indications That Dispel "Presidential Year" Depression.

Despite the depressing effect ordinarily exerted by "presidential years" on business in general, it is altogether likely that the automobile business at least will escape the baneful effects of the present political campaign. The money market is easy and the crops are unusually bountiful, and at least two of the foremost automobile manufacturers report orders in hand that move them to name 1913 as the industry's banner year.

"We already have received orders for more cars than were sold by us during the entire season of 1912," says Charles T. Jeffery, president of the Thomas B. Jeffery Co. of Kenosha, Wis., Rambler manufacturers. "While our dealers everywhere report an unusually encouraging outlook, prosperity seems most pronounced in the agricultural States of the Middle West and in Texas."

Much the same opinion is expressed by G. W. Bennett, vice-president of the Willys-Overland Co. of Toledo, O., who states that already some 36,500 Overland cars have been contracted for by dealers throughout the country "There seems no room for question that 1913 will prove the biggest year in the history of the automobile in this country," he says. "We do know, at least, that it is going to be the bonanza year for the Overland. Our 1913 announcement was made only two weeks ago, and we are sanguine that within the month the total number of cars disposed of to dealers will be increased to 50,000."

Esterline to Add to Productions.

Having purchased one-half of the $250,000 capital stock of the Esterline Co., of Lafayette, Ind., Carl Fisher and J. G. Allison, owners of the Prest-O-Lite Co. and the Indianapolis Motor Speedway, are making ready to remove the Esterline plant from Lafayette to Speedway, the "horseless city" which they have under construction near to the motor speedway itself and where several of their enterprises will be concentrated.

While the Esterline Co. heretofore has confined itself to the production of the Berdon electric lighting system, it is known that the company has in hand a combined electric starter and lighting device, which has been tested for more than a year and which is said to be a radical departure from all other systems. It is nearly ready for exploitation. The manufacture of a new automobile lamp also will be taken up. It already has been fully developed, and is claimed to posses the remarkable quality of giving a light which pierces fog, mist and dust but which is not blinding to the eye. The reflecting surface in this new lamp is of a material which will not tarnish and which is not easily scratched or soiled by cleaning. A recent test in Detroit showed that in a dense fog a 16-candlepower bulb in front of one of these new reflectors projected its light three times as far as the rays from a 200-candlepower arc lamp.

Marion Names Men for Four Districts.

To better handle its increased production, the Marion Motor Car Co. has divided the country into four sales districts, each in charge of a district manager, the men for which just have been appointed. They are Charles H. Tyler, former manager of the United States Motor Co.'s Cleveland branch, who will handle Michigan, part of Ohio, western New York and Pennsylvania; C. B. Riggs, former manager of the Olds branch, Kansas City, who will have charge of Missouri, Kansas, part of Oklahoma, Nebraska, Colorado, Utah and Wyoming; W. W. McClure, previously a Marion traveler and dealer, who will assume direction in Texas, New Mexico and part of Oklahoma; and Howard W. Harrington, who has represented the Marion interests on the Pacific Coast, who will remain in charge of that extensive territory. All of the district managers, of course, will be subsidiary to F. G. W. Sudrow, the general sales manager located at the Marion factory in Indianapolis.

Goodyear Enters Own Home in 'Frisco.

The Goodyear Tire & Rubber Co. of California has taken possession of the building at Van Ness avenue and Sutter street, San Francisco, which was erected for its occupancy. It is a striking two-story concrete structure, suggestive of mission architecture, its interior appointments being similar to those adopted by the Goodyear branches in other parts of the country, which are alike pleasing to the eye and designed to promote quick and competent service.

Larger Quarters for "Lubro" Makers.

The M. & M. Co., which manufactures lubricating oils and greases that are marketed under the trade-marked name "Lubro," has leased a four-story brick building not far from its present location at 500 Prospect avenue in Cleveland, O., and shortly will move in. The new quarters are located at 114-116 Prospect avenue, N. W. Thomas C. Jones, for several years head of the lubricating oil department of the company, will have full charge of the new plant.

Asks Receiver for Top and Tire Company.

The O'Bannon Corporation of New York City, dealer in artificial leather, has filed a petition in the Superior Court in Indianapolis, Ind., asking the appointment of a receiver for the Indianapolis Auto Top and Rubber Tire Co. The plaintiff alleges that the Indianapolis concern is in danger of becoming insolvent and that it has obligations of $5,000. The O'Bannon claim is for $183.43.

TAKES PRINCE TO NEW YORK COURT

Company That Made Its Tires Seeks Balance Due—President Also Involved Because of Personal Guarantee.

Because he guaranteed the account of the Prince Tire Co., of New York, up to $5,000, W. C. Shoup, its president, has been made party defendant in a suit instituted by William Hammereich, of Brooklyn, N. Y., against the Prince Tire Co., which has been placed on the call calendar of the New York Supreme Court, Special Term, Part I.

Hemmereich, who sues for $3,900.45 and interest from June 6, 1911, is acting as the assignee of the Acme Rubber & Mfg. Co., of Trenton, N. J., which manufactured the Prince tire. The amount in issue represents the balance due for goods which the Acme company manufactured and delivered between May 11 and September 29, 1911, the total bill amounting to $38,536.72, of which $35,636.27 was paid.

According to the complaint in the case, the Acme company manufactured the Prince tires and tubes from moulds and matrices furnished by the Prince people and under a contract signed by Shoup which released the Acme company from all responsibility, other than that involved by the actual manual labor incident to the production and proper use of the equipment furnished by the defendants and the proper vulcanization of the material. Shoup, as stated, guaranteed the account up to $5,000, his guarantee bearing date of December 30, 1910.

Oakland Establishes Philadelphia Branch.

Following its recently adopted policy of establishing branch houses in the larger distribution centers, the Oakland Motor Car Co., of Pontiac, Mich., will, on September 1st, open a branch in Philadelphia. It will take over the business of the Oakland Co. of Pennsylvania, which for the past three years has acted as Philadelphia agent for Oakland cars. Edward W. Leech, who for the past eighteen months has been general manager of an automobile trade journal, has been placed in charge, his territory embracing Eastern Pennsylvania, Southern New Jersey, Delaware and Northern Maryland.

Atwater-Kent Completes Removal.

The Atwater-Kent Mfg. Works, which produces ignition apparatus, has completed the removal of its factory equipment from 42-46 North Sixth street, Philadelphia, to a new building situated on the line of the Philadelphia and Reading Railway, at the corner of East Logan street and Stenton avenue. The new building is a one-story structure and provides 21,000 square feet of floor space for the new Unisparker which is being made ready.

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John Duggan plans to erect a garage in Connellsville, Pa.

John Hayes of Chillicothe, O., has bought Louis Bierley's garage.

Everett Evans of Williamsburg, Ia., is about to open a garage.

Edward Baldwin contemplates the erection of a garage in Stockport, Ia.

Don P. McClure of Oskaloosa, Ia., has bought the Anderson Bros. garage.

H. Werner has opened an automobile and carriage painting business in Berkeley, Cal.

S. E. Mulkins of Beaver, Ia., is about to open a garage in Cedar Falls, in the same state.

The Geometric Tool Co. has commenced the construction of a garage in Westville, Conn.

C. D. Richards and Edward Shiffer are about to enter the garage business in Nodaway, Ia.

D. Carson Fleming of Denver, Col., is about to build a garage; the site is at 1200 Broadway.

J. I. McFarland has awarded the contract for a garage in Lodi, Wis. It will cost $6,000.

Henry Cain of West Concord, Minn., has purchased a garage in Monticello, in the same state.

William Newby and M. Barels have purchased a site in Sac City, Ia., and will erect a garage thereon.

Arthur Peterson is erecting a garage at 5950 Drexel avenue, Philadelphia, Pa. The cost will be $2,000.

Thornton Newsum of Memphis, Tenn., has opened a United States Tire Co. branch in Little Rock, Ark.

F. E. Parker of Melrose, Mass., is to build a garage at Jericho Beach, near Scituate, in the same state.

Walter S. Kidder of Dayton, O., has purchased a site at Grand and Salem avenues and will build a garage.

Harry L. Slusser of Marion, O., has sold his interest in the Cadillac Garage to C. E. Miller and J. B. Gunder.

C. A. Bishop of Bedford, Ia., has sold his garage and automobile business to Hand & Hayes of Des Moines.

D. S. McNeill and Edward Milligan of Eureka, Kan., have taken over the Hodgson Garage in that town.

Grover Hendershot of Oxnard, Cal., has leased the Crescent Garage; Milton Stiles was the former operator.

George Immel, of Reading, Pa., has purchased the interest of Walter Strunk in the Park Auto Sales Co.

A two-story brick garage, 50 x 120 feet, is being erected in Oelwein, Ia., for Fred Fields, who will operate it.

W. S. Wright, of Benson, Neb., has purchased the interest of his partner, B. Prior, in their automobile business.

C. L. Oswalt has purchased Clyde Wilson's interest in the Gravity (Ia.) Garage; Oswalt is now sole proprietor.

L. D. Moss has disposed of his interests in the Homestead (Pa.) Garage; T. S. Mitchell now is sole owner.

H. F. Goodwin of Pasadena, Cal., is erecting a garage at Union street and Broadway; it will cost $11,000.

Charles Ludes and Jacob Oxnlor have leased the Ferguson Garage in Shenandoah, Pa. They will open immediately.

Harry Gabel, of Belvidere, Ill., is about to build salesrooms at First and Pearl street; he will handle the Hudson.

W. H. Pitts, of Caldwell, Kan., has purchased the Fifth Street Garage of G. F. Sicks; Pitts will continue the business.

Edward Sellman and W. B. Reed of Decorah, Ia., have entered the automobile trade; they have the Overland agency.

W. A. Sawyer of Bucyrus, O., has sold his garage to L. R. Sponseller of Cleveland; the latter takes possession September 1.

R. S. Sollender, proprietor of the Sisson (Cal.) Garage, has sold an interest to C. E. Glidden and his son, Arthur Glidden.

The Turner Hardward and Implement Co. of Modesto, Cal., has gone into automobiles; it represents the Oakland line.

William Edwards has withdrawn from the firm of Edwards & Postier, in Rochester, N. Y. The firm now is West & Postier.

William Read & Co. is the style of a new automobile firm in Traverse City, Mich. Supplies and two lines of cars will be handled.

D. E. Skinner is about to build a concrete garage at 724 13th avenue, Seattle, Wash. The plans call for an expenditure of $5,000.

W. A. McIntosh, of New Bern, N. C., has had plans prepared for a garage; it will be built at Craven and South Front streets.

John Rasmussen and J. L. Burnes have formed a partnership in Gilmore City, Ia., and will open a garage; they have the Ford agency.

Charles Schlear of Cincinnati, O., plans to erect a garage, 30 x 100 feet, in Evanston, in the same state; it will be of steel and brick.

E. W. Golud has sold the Smithtown (L. I., N. Y.) Automobile Co. to Edward Baxter; the latter already has assumed possession.

Perry Goembel has purchased the Bunn interest in the Bunn & Goembel Garage in Pipestone, Minn. He will conduct the business alone.

Glenn Black of San Francisco is about to enter the trade in Lodi, Cal. He will build a garage and machine shop; the site cost $5,000.

H. O. Davis has retired from membership in the company operating the Highland Park (Cal.) Garage; the firm is Hake & Williams.

V. E. Hardy & Son of Fonda, Ia., have purchased an interest in the Morrison & Smith Auto Co. The purchasers will manage the business.

The Perth Amboy (N. J.) Garage is about to establish a number of branches; the first will be located in New Brunswick, in the same state.

F. Wolfsberger, a dealer in farm implements and vehicles in Honeoye Falls, N. Y., is erecting a two-story concrete garage, 120 x 50 feet.

Fred Worselry of Maplehill, Kan., is about to open a garage in Perry, in the same state; he will have the Auburn and Hudson agencies.

Housatonic, Mass., is soon to be possessed of a new garage, 50 x 28 feet; Jules Clerc of Pittsfield, in the same state, will be the proprietor.

Len Rector and Bernie Hinton are about to enter the garage trade in Fairmont, Minn. They will operate under the style Rector & Hinton.

Permission has been granted to the Union Realty Co., of Los Angeles, Cal., to build a garage at Grand avenue and 18th street; it will cost $20,000.

George Thorson, of Grand Forks, N. D., has purchased a building at 3rd street and International avenue and will remodel it for garage purposes.

J. E. Wilber & Co. have opened a garage at 1509 Blue Hill avenue, Boston; E. Horton is manager. The establishment has a capacity for 70 cars.

Max Hertz of Newark, N. J., has secured permission to build a garage at 58-60 Oliver street; the application stated the garage would cost $2,000.

The Carercar Co. of Omaha, Neb. has opened branches in Denver and Minneapolis; H. E. Heddington will manage the Denver establishment.

Glen Black of San Francisco is about to

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build a garage, 100 x 100 feet, in Lodi, in the same state; his site is at Sacramento street and Lodi avenue.

Ray Clifton, William Dorst and Maynard Davis have formed a company in Middleport, O., to operate a garage; they will open on Mulberry street.

John H. Fleming, owner of the City Hall Garage in Scranton, Pa., has opened a second establishment under the style City Hall Annex; it is at 311 Adams avenue.

Permission has been granted to J. A. Sterrett of Pittsburgh, Pa., to erect a one-story brick garage on Aylesboro avenue; it will represent an expenditure of $3,000.

Hudson-Latham Motor Co. has been organized in Kansas City, Mo., to handle Hudson cars in that territory; salesrooms have been secured at 1717-19 McGee street.

The Nelsonville (O.) Garage and Supply House has been sold by O. E. Morgan to Frank Minner; he has changed the style to Minner's Garage and Repair Shop.

Edward Milanowski, of Grand Rapids, Mich., plans to build a two-story brick garage at Michigan street and Grand avenue; the specifications name $3,000 as the cost.

The Frankfort & Cincinnati Railroad Co. has inaugurated a motor 'bus service between Stamping Ground and Owenton, Ky. The cars have capacity for sixteen passengers.

The Interlock Sales Co. has succeeded the Western Automobile Supply Co. at 2025½ Commerce street, Dallas, Tex. James Robertson is manager of the new concern.

The Rex Garage and Auto Repair Shop, in Harrisburg, Pa., has been purchased by E. C. Hawthorn and George Wolfe; they will operate it under the style Rex Auto Garage.

Harry Collier is about to enter the garage business in Belvidere, Ill. He has purchased a site at Logan avenue and Whitney street and will erect a two-story structure.

H. C. Osterman of Deadwood, S. D., has bought the Hogarth Garage and will replace it with a new structure; the transfer involved $15,000 and the new garage will cost $8,000.

H. Bale of Little Rock, Ark., has purchased the Ford agency from the Land Mitchell Auto Co. of that city; he will maintain salesrooms at 519 West Markham street.

J. F. Killoren, of Duluth, Minn., has secured permission to erect a garage on Branch street, between 27th and 28th avenues, east; it will represent an expenditure of $3,500.

O. E. Martin of the Martin Motor Co. of St. Paul, Minn., has bought full interest in that company and will conduct the business personally; the firm has the Peerless and Velie agencies.

Albert E. Bihler, who for some time has been manager of the Independent Garage in Omaha, Neb., has branched out for himself; he has opened a garage and repair shop on Farnam street.

V. E. Hardy of Fonda, Ia., has purchased an interest in the Morrison-Smith Auto Co.

Work has been commenced on a new garage in Rockford, Ill. G. O. Mitchell and N. J. Popham will operate it.

William Schwartz, of Richmond, Tex., is about to enter the trade in Brenham, in the same state; he has purchased two brick buildings on West Alamo avenue, and will remodel them for his business.

The Republic Rubber Co. of Texas has been formed in Dallas to handle Republic tires in the Lone Star State. R. M. Randal, formerly of the Slaughter-Randal Co., is general manager of the new enterprise.

J. E. McCreery, operator of an automobile sales, garage and supply business in Havana, Ill., has sold the garage and supply end of his trade to Jean Brooner; both businesses will remain in their present quarters.

George H. Wahl, for five years with the Ford Motor Co., has organized the Wahl Motor Sales Co. and secured the Rambler representation for the State of Michigan. He has located a salesroom at 268 Jefferson avenue, Detroit.

Despite the fame of Amherst College, the Massachusetts city of that name has lacked a garage. The deficiency is to be supplied, however, by Dr. Henry Paige, who is preparing to erect a garage, 50 x 80 feet, on South Prospect street.

A company has been incorporated in Columbia, Ky., to operate an automobile 'bus service between Columbia and Campbellsville, in the same state;; the incorporators are J. O. Russel, W. R. Myers, Samuel Lewis and A. P. Ballard.

H. F. Sundin, formerly connected with the National Motor Vehicle Co. of Indianapolis, has entered the trade for himself; he has the National agency in Kansas City, with salesrooms and service station at 11th and Locust streets.

Indicating one of the results of the accession of Harry M. Jewett to the presidency of the Lozier Motor Co., of Detroit, is the Lozier branch in Boston, Mass., has taken on the agency of the Paige car. Mr. Jewett himself is president of the Paige-Detroit Motor Car Co.

Smith & Haberle, of St. Paul, Minn., contrary to a report that they have taken over the Hudson business in Minneapolis to operate it in conjunction with the Hudson agency in St. Paul, state that they have not handled the Hudson since 1911; the firm handles Chalmers cars and will continue as Chalmers dealer in St. Paul.

Having been without representation in Cleveland for some little time, the Empire Automobile Co., of Indianapolis, Ind., has made arrangements whereby its products will be exploited in the Ohio city again, a corporation styled the Empire Motor Sales Co. having been formed for the purpose. Headquarters have been established at 1212 Huron road.

For the purpose of distributing Abbott-Detroit cars in Boston, Mass., and a section of New England, the F. A. Dutton Motor Car Co. has been organized in that city. Headquarters have been established at 76 Huntington avenue, and when the building which now is in process of construction is completed, it will be occupied as a service station and garage as well as a salesroom.

Although a receiver was appointed for the Empire City Automobile Co., of 1800 Broadway, New York City, a week ago, 8th inst., following a petition in bankruptcy by three former employes, the appointment was vacated the following Saturday by Judge Holt in the Federal court; this action was brought about by claims of members of the company to the effect that it is perfectly solvent and has liabilities of but $3,000, while its assets are $38,000.

Changes Among Prominent Tradesmen.

O. L. Harrison has been appointed sales manager of the Dayton Engineering Laboratories Co., of Dayton, O. Formerly he was with the Electric Storage Battery Co., of Philadelphia.

George P. Wilson, sales manager of the Warren Motor Car Co., of Detroit, has been transferred to New York City, where he will handle Warren sales in the eastern half of the country. He will have the title eastern sales manager.

H. F. Vortkamp, who previously was identified with the Candler Radiator Co., of Detroit, has been appointed sales manager of the Mayer Carburetor Co., of Buffalo, N. Y. He, however, will make his headquarters in Detroit.

In order to become identified with the General Motors Truck Co., of Detroit, William L. Day has resigned the sales management of the Mitchell-Lewis Motor Co., of Racine, Wis. He has been succeeded by Leo A. Peil, of Racine.

R. H. Williams has been promoted to the post of sales manager of the F. B. Stearns Co., of Cleveland. Although ranking as one of the youngest managers in the trade, he has had wide experience, having covered the entire United States in the Stearns interests during the past four years.

G. L. Mitchell, manager of the Toronto branch of the Diamond Rubber Co., has resigned that position and removed to Detroit. In the latter city, he will be identified with the Republic Rubber Co., of Michigan, at 1001 Woodward avenue, in which he has been a silent partner for some time.

Harry S. McClellan, superintendent of the Maxwell-Briscoe branch factory in New Castle, Ind., has resigned that position to become assistant manager of the American Automobile Co.'s plant in Indianapolis. In his new capacity McClellan will have charge of the manufacture of the underslung car.

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THE MOTOR WORLD

PUBLISHED EVERY THURSDAY BY

The Motor World Publishing Company
1600 BROADWAY, NEW YORK, N. Y.

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Subscription, Per Annum (Postage Paid) $2.00
Single Copies (Postage Paid) . . . . . 10 Cents
Foreign and Canadian Subscriptions $3.00
Invariably in Advance.

Postage Stamps will be accepted in payment for subscriptions. Checks, Drafts and Money Orders should be made payable to The Motor World Publishing Co.

☞Change of advertisements is not guaranteed unless copy therefor is in hand on SATURDAY preceding the date of publication.

Contributions concerning any subject of automobile interest are invited and, if acceptable, will be paid for; or, if unavailable, will be returned provided they are accompanied by return postage.

Cable Address, "MOTORWORLD," NEW YORK.

Entered as second-class matter at the New York Post Office, November, 1900.

NEW YORK, AUGUST 29, 1912

PLEASURE CHASSIS FOR COMMERCIAL SERVICE.

It is the history of motor car engineering, as well as of engineering in general, that an attempt, unsuccessful in the earlier stages of an art, often may be revived, with satisfactory results, when the lessons of experience have been learned. In other words, that which proved a failure due to lack of scientific knowledge often may be made a success when such knowledge has been acquired.

The light commercial vehicle built on pleasure car chassis seems to be a case in point. When the motor car first acquired recognition as a reliable means of transportation for passengers, it was a short and obvious step to its employment for the transportation of merchandise by the substitution of a suitable body. Theoretically this was unobjectionable, provided the capacity of the machine was not exceeded, but practice did not agree with theory, as a rule, though in a few cases the better built—and usually more expensive—cars stood up to the work. The inevitable difference between the care given a pleasure car and that accorded to a business vehicle, and the fact that the latter necessarily works continuously instead of intermittently, soon brought out weaknesses that resulted in the practical adandonment of the pleasure car chassis for commercial service.

Recently, however, there has been a revival of the practice, and in view of the improvements made of late years in all branches of automobile construction—not forgetting pneumatic tires—there is reason to believe that the results will be encouraging. It seems like turning back the hand of time but it is easy to see the advantage accruing to the manufacturer and dealer handling a moderate priced chassis that is available, practically without change, for either pleasure or commercial work, for the opportunities for sales are multiplied while the manufacturing facilities remain unchanged, barring possible enlargement. It hardly is necessary to emphasize, however, that pleasure car construction, no matter how good, is suitable only for the lighter classes of commercial service in which it is usual to employ pneumatic tires to preserve the chassis from the effects of vibration.

CAR EQUIPMENT AS A SELLING FACTOR.

In seeking an apt designation for the forthcoming year, probably opinion will be evenly divided as to whether "six-cylinder year" or "full equipment year" will be the more fitting. It is certain, at any rate, that the item of equipment, and the fullness thereof, has become a selling point, the most of which is being made by manufacturers and dealers alike.

Individual beliefs to the contrary, and despite earlier indications, its equipment has become practically a part of the car itself, and the manufacturer or dealer who indulges himself in the thought that more than the very minimum of "extras" can be maintained and charged for is due to have very much more work in disposing of his goods than hitherto has been the case.

The situation, perhaps, never was more aptly expressed than by a prospective purchaser of the feminine persuasion who, informed that certain articles of equipment of a high priced car were "extras," exclaimed, in unfeigned astonishment: "Why, when I purchase a dresser I am not required to pay extra for the mirror, the casters or the handles on the drawers."

The situation, too, is such that the value of reputation never was more apparent. The manufacturer of an accessory which constitutes a part of a car's equipment, and which is pointed to with pride, and the name of which rolls easily off the car manufacturer's printing press or the dealer's tongue, is happily positioned and now can count well spent the time and money which were required to acquire the reputation. When such accessories admittedly assist the sale of a car, the moral is plain.

SYMPATHY FOR THE INSURANCE COMPANIES.

Pity the poor insurance companies! Because the ratio of automobile accidents shows an increase it is greatly to be feared that unless automobile rates are correspondingly advanced, few, if any, of the big companies, or the little ones for that matter, will be able to pay their presidents more than $50,000 or $100,000 or to erect more than 20-story skyscrapers during the approaching year, which, on the face of things, would be little short of public calamity. In emphasizing stresses to which they are subjected, however, it is unfortunate that the insurance people do not occasionally dilate on the clever move which was made, not many months ago, when they decreased their risks and thereby made an enormous saving by the simple but arbitrary process of fixing $25 as the line at which their responsibility for damage commences, as against the $15 limit which previously prevailed. As by far the overwhelming proportion of damage sustained by automobiles figures out at less than $25, the savings thus effected should serve very considerably to offset the increased ratio of accidents of which so much now is being made.

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"LEAGUE" SHOWS ITS GENEROSITY

Irritated by Price Protectors, Foregoes Pennies to Revise Patent Law—Also Offers to Aid "Charity."

Charity itself, which is said to cover a multitude of sins, apparently enters very largely into the makeup of the International Automobile League of Buffalo, N. Y. In fact, the man who practically comprises the league is so overfull of charity, or philanthropy, or whatever one cares to term it, that it almost appears that nothing would please him better than to give "free, gratis, for nothing" to the people whom he almost lovingly calls "members" and whom, though they pay no "dues" and have neither voice nor vote in the affairs of the league, certain automobile accessories which he is unable to obtain as easily as he obtains other accessories.

In its day the league has had lots of trouble in obtaining certain things; it often has traveled devious avenues to obtain them and, after becoming possessed of them, it more than once has been haled to court to explain its possession. On several occasions the court has required that it pay dearly either for its unauthorized sale of the goods or for tampering with the prices or trademarks thereof, all of which has aroused the league to great indignation and caused its chest to bulge with resentment or charity.

Apparently the league does not believe that men have any right to protect the fruits of their ingenuity or labor; he would do with such wares as he wills and he believes he has found a way to do it. At any rate, the charity which surges within him has impelled him to forego "every penny that the league is forced to charge its members over the actual cost" at which it can buy the accessories around which the manufacturers have thrown the protecting arm of the law, greatly to the discomfiture of the league. Having, figuratively, at least, put the pennies aside, he means to employ them "to carry on the fight for revision of the patent law," which revision, when it is brought about, will enable him to sell such things as Weed tire chains, Klaxon horns, Jones speedometers and "other outfits of the kind," to employ his own language, at what the league and its owner considers a "fair, proper and reasonable amount of profit." The manufacturers of these articles have given the league great pain. They have pursued it in the courts, a procedure which has proved both disagreeable and expensive to the league.

Just how many pennies the Buffalo outfit has accumulated to revise the patent laws is not made clear. In fact, the league's charity appears somewhat mixed, for in the same itssue of its "catalog and journal"—sent to members only, even though they have not paid their "dues" since the time the league was floated—in which this patent revision fund is announced, it stumbles over its own feet by declaring that its savings on Jones speedometers, in the sale of which it is operating under an injunction, will be diverted not into the "patent revision fund" but into the channels of pure, unadulterated and almost holy charity.

If, "when sending in your order and remittance for Jones speedometers," the league says to the "members" who gave up good money for the rare privilege of buying goods which it has for sale, "will give us the names of two charitable institutions in your vicinity, which you deem worthy of assistance, we will be glad to select one of them and draw our check to its order for the difference between the cost to us and the retail price, forwarding it in your care so that we may be sure it will reach its proper destination."

Could Charity herself, even with the assistance of Hope and Faith, devise a more cunning means of benevolence in assuring that checks shall reach their "proper destination," even under the cover of an injunction issued by a United States court?

How Ford Avoided 186 Freight Cars.

Giving evidence of the tremendous number of completed cars that periodically are shipped from the plant of the Ford Motor Co. in Detroit, and, incidentally, an inkling of the savings which it is expected ultimately will be made in transportation costs when the Ford system of assembling cars in the principal trade centers is running full blast, no less than 630 cars were shipped last week destined for Kansas City, Mo., where the first of the Ford assembling plants is in operation. Despite the number of cars in the shipment, however, only 24 freight cars were required to contain them, although if they had been completely assembled 210 freight cars would have been required. Under the new arrangement, however, two cars contained dashes, one held radiators, six held motors, nine held frames, one held wheels, three held fenders, one held tanks, and one held miscellaneous parts. The value of the shipments was approximately $434,700.

Price of "Petrol" Lowered in England.

Probably by reason of the prolonged agitation which has resulted from the high cost of gasolene in Great Britain—at least, that is the reason ascribed—a slight reduction last week was scheduled by the British Petroleum Co., which supplies the bulk of the fuel used in the metropolis. The price of fuel now stands at 33 cents a gallon, which is a reduction of 4 cents a gallon. How long the lower price will obtain is not vouchsafed by the vendors, and, having become accustomed to the frequent fluctuations in price which within the past few months have precipitated much hard feeling against "petrol" producers, motorists are inclined to view the present reduction with suspicion as presaging a quick return to the higher rate, with an increase tacked on.



August 30-31, Elgin, Ill.—Road races under the auspices of the Chicago Automobile Club and the Elgin National Road Race Association.

September 1-2, St. Louis, Mo.—Track races promoted by the Universal Exposition Co.

September 2, Washington, D. C.—Motor truck parade conducted by the Washington Post.

September 3-6, Chicago, Ill.—Chicago Motor Club's reliability run for commercial vehicles.

September 7, Hamline, Minn.—Track races promoted by the Minnesota State Fair Association.

September 7-9, Santa Clara, Cal.—Road races under the auspices of the Santa Clara County Fair Association.

September 17, Milwaukee, Wis.—Grand Prize road race under the auspices of the Milwaukee Automobile Dealers' Association.

September 21, Milwaukee, Wis.—Vanderbilt Cup race on the Greenfield course, under the auspices of the Milwaukee Automobile Dealers' Association.

October 7-11, Chicago, Ill.—Chicago Motor Club's reliability run.

Adds Jobbing Accessory Department.

The New York Coach and Auto Lamp Co., of 302 West 53rd street, New York City, which manufactures universal automobile lamps, acetylene generators and a number of other automobile specialties, has added a jobbing automobile supply department. It will be devoted to the wholesale distribution of supplies of all kinds.

Tire Filling Epidemic Reaches Boston.

The Perfection Filler Co., which has been organized in Boston, Mass., to produce a tire filler compound of that name, has established offices in the Motor Mart, at 216 Pleasant street. They are in charge of George F. Kehew, as sales manager. The filling compound itself will be concocted in a plant in Somerville, which is a part of Boston.

To Prevent Blowing out of Gaskets.

If it should be necessary to make exhaust manifold gaskets of plain asbestos sheet, the almost inevitable blowing out can be postponed by twisting up two rings of wire, somewhere about 18 gauge, and placing them on either side of the gasket before tightening the flange bolts.

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MAKING OLD TIRES INTO NEW ONES

Which Assists the Answer to the Oft-Reiterated Question: What Becomes of the Old Tires?—Their Money Value and Their Buyers.

"Where do all the old pins go?" is a time honored and as yet unanswered question, but what becomes of all the old automobile tires is one that is not shrouded in mystery, that is, to those who are versed in automobiles. For the most part they are with but few intervening steps returned directly to the consumer as new tires.

Naturally, the tires go through several "handlings" before the plant where the rubber is remade, or reclaimed, is reached. Each junk dealer, each garage keeper, and a good proportion of chauffeurs form channels through which the tires reach the plant from the motorist, and the prices which the latter receives for the discarded shoes and tubes depends very much upon the person to whom they are sold. As is the case with new rubber, however, the market is a fluctuating one, and the prices paid for the old material varies within wide limits. The condition of the materials sold also has its effect upon the price paid for the rubber. Thus, a shoe which is worn down nearly to the fabric or even partially through the fabric, will not only bring the seller a smaller sum through reduced weight, but will also bring less per pound, since the proportion of rubber which can be reclaimed from the total weight is considerably less than is the case where the tread is but slightly worn and the shoe is discarded because of a blowout or similar defect.

The average price paid for old tires by the chauffeur or garage man, who must needs dispose of them through the intermediary of the junk dealer, is in the neighborhood of 5 cents a pound; junk dealers' prices run from 5 to 7¼ cents a pound, according to the condition of the shoe. The junk dealer, in turn, disposes of the rubber to a second-hand rubber dealer, who sells in carload lots directly to the plant. The junk dealer receives between 7 and 7½ cents a pound for the product, depending entirely upon the condition of the market, and the rubber dealer receives up to 9¼ cents a pound and as low as 8¼ cents. The average price the motorist receives for a shoe when he deals directly with the junk dealer is $1.10. When the shoes are disposed of through the garage man and chauffeur, 70 cents is a very fair price. Tire dealers, too, form a link in the chain which connects the tire user with the reclaiming plant, and indeed it is through the intermediary of the tire dealer that the greater proportion of old tires finally reaches the reclaiming plant. The tire dealer, however, but rarely pays cash for an old shoe or tube but takes them as part payment for new tires.

The reclaiming process itself is not at all complicated. The tires first are sorted, those with metal studs which are apt to injure the rolls of the various mangles are cast aside for special treatment; others which have leather or other composition treads are similarly treated. The beads, which contain rubber which is very hard and not conducive to the production of a smooth finished product, are removed, the remainder of the tires then being passed through slicers, where they are cut into small pieces by revolving knives. Later they are passed through shredders, from whence they emerge divided into very fine particles.

Chemical treatment then removes all trace of the cloth or fabric, the treatment consisting of boiling the shreds either with sulphuric acid until the acid has disposed of all of the cloth fibers and then neutralizing the acid with suitable alkali solutions, or of boiling with caustic soda, which also destroys all traces of the fabric. In either case, the material is washed and rewashed with water after all chemical action has ceased, to remove all traces either of alkali or acid. In some factories the chemical method of removing the fabric is not resorted to, the chaff, as the fabric fibers are called, being removed from the well ground mass by the action of a blower.

After the removal of the fabric the mass is ground to a fine pulp between steel rolls and passed through sieves to remove any foreign substances. Later, suitable vegetable oils are added to make the mass easier to work and to insure the homogeneousness of the final product. The stock is again ground and passed through fine sieves and then devulcanized—that is, the sulphur which originally was introduced is removed by the action of steam under high pressure. Subsequently the rubber is dried and formed into sheets, in which form it is marketed.

Even the best grades of reclaimed rubber, however, are suitable for use only as filler—that is, in the inner portions of the tire where it is not subject to severe strain. The price of the finished product varies according to the grade and the condition of the market from 23 to 33 cents a pound. Considering the loss of weight from the raw material—about 45 per cent. of the original weight is represented in the chaff—and the cost of the various processes, the reclaiming of rubber pays the manufacturer about a cent a pound on the original investment, according to government statistics.

How the Sale of Tires Has Increased.

According to figures direct from the factory at Akron, a total of 485,983 Goodyear automobile tires were sold during the first six months of the current year. During the corresponding period of 1911, the sales totaled 186,307 tires.

PUBLICITY AS A DEALER'S CAPITAL

How Keeping in the Public Eye is of Value Not Measurable in Dollars—Square Dealing and Nose for News That May Keep Business.

"M-o-r-n-u-n-n-n p-a-p-r-r-r!" sang a newsboy in the nasal drawl which is the distinctive and inimitable accomplishment of that juvenile business man; and as the Sales Manager accepted the proffered paper and handed over a nickel, never hesitating for the change, the boy, without a variation in his three-tone tune, continued his solo for the benefit of the straggling throng which was coming from the mid-forenoon train into this thriving municipality. Like many another business man, the Sales Manager had opened the paper and was busily reading even before he reached the trolley car which would carry him down into "Automobile Row" and to Reilly's salesroom.

Reilly was engaged with a prospect when the Sales Manager arrived, so, pending the leisure of the dealer, the man from the automobile factory adjourned to the office where, for a full half hour he continued to digest the day's offerings of the News. He had disposed of the developments in the latest official scandal in the Metropolis, skimmed the other telegraph features, assimilated the leading stories in the local pages and, as Reilly came in with a newly signed contract in his hand, the Sales Manager was deep in the automobile page which the News featured once a week as a peg upon which to hang sundry columns of automobile advertising.

"All over the page, as usual," said the Sales Manager. "Look at it! Reilly, Reilly, Reilly—and here's some more Reilly." With this last remark the reader pointed to a smaller story which, hidden in a lower corner of the page, was not so conspicuous as the other articles bearing reference to the live little automobile man. Reilly merely smiled, but the smile meant much. Even if he did dislike flaunting himself before the public, he nevertheless realized the value of this limelight, and because of its value he could afford to put aside scruples which were linked with an inherent modesty.

"Have you subsidized this sheet?" asked the man from the factory.

"Why do you ask? Do you think I would do that?"

"I retract any insinuation," was the reply, "but some of the other dealers in this town do not hesitate to say that the reason you get yourself and your business in the papers so much is because you hand out money, and that you really pay as much for the write-ups as you would if you were using regular display advertising."

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"I know they say it, but I've got all over getting sore about it. They don't get along well with the papers, and they are disgruntled if anyone else does. I know I get considerable newspaper publicity, but I get it legitimately; furthermore, a good newspaper man won't take money."

"I wish all of our dealers were as good press agents," mused the Sales Manager, as he continued to gaze at the automobile page, which was no exception to the general run, and in which Reilly was a leading character. "I wonder if they couldn't be educated up to it," he added.

"I don't see why not," replied the dealer. "I figured it out for myself. It's no happenstance. Anyone ought to be able to do it."

"'Anyone ought to' sounds well, but how about the 'do it' part?"

"Maybe they couldn't," continued Reilly thoughtfully. "I suppose I have qualifications that not all the dealers have. To begin with, not all of them know news when they see it; they wouldn't know a story if it should jump up and kick 'em in the face. And what's probably fully as important is that all they think of is getting their own names in the paper and expect to operate a one-sided arrangement. They try a few times, get sore because the papers wont' print everything that is handed them, and then they quit and declare that anyone who gets publicity must be paying for it. It is paid for, but not with money.

"I always made it a point to get acquainted with the automobile writers and the city editors and, in fact, some of them are real personal friends of mine now. Whether they remain newspaper men, I will always value their friendships, for they are worth retaining. The papers like to get live automobile news on their automobile pages, and sometimes they have a pretty hard job. One man generally is assigned to dig it up, and so few dealers know the live kind of stuff he wants But I do know; I never offer anything in the way of news unless it looks as if it would make a real newsy story, and if a man takes a story and it fails to appear, it is nothing to get sore about, for there are so many trials in getting out a daily paper that there generally is a good reason for the story's failure to get into print; also, a paper is its own judge of what it shall print, and the man who kicks speedily falls into ill repute.

"Neither should a man expect to get equal treatment in all papers. Papers are peculiar things; they all like to get exclusive stories, and if a thing has been featured in one the rest drop it cold. The News is my best friend; also, it is the best paper. When I have news I try to save it for the News and they show an appreciation. They have no hesitation in banking on stuff I give them as exclusive, for I don't try to get stuff in the other papers; in fact, they don't use much about me except what they ask for.

"Another reason why I seem so strong is that I am out to do the News a good turn if I can. Instead of watching for stories that will get me and me only into the limelight, I like to turn up anything I can. I am around town a lot, and if I hear of a good story I tip them off, and that will make a man stronger in a newspaper office than anything I know of. I got my best reputation and have had the most publicity within the last six months, and it all dates back to the time I handed the News a 'scoop.' There was a suicide in the apartment house where I live, and the commotion following the finding of the man waked me up. It was about 2.30 in the morning. I knew who the man was and it didn't take but a minute to learn the principal details. Lots of people would have said, 'I'm not working for the paper; let 'em get their own stuff.' But I knew how much a story means to a man when his bread and butter consists in digging up stories, so I called up the News and told them enough so that they got the story in time—for it was close to press time. The rest of the papers didn't hear of it until after it was reported to the police, and the papers were all out then. It was a big story, for he was quite a prominent politician. They kind of look to me for news now, and they print my automobile stuff along with the rest.

"It means a lot to me, too. It has got so now that some people think I am the automobile authority in this town. Why, one time one of the churches that runs a sort of young men's club wanted to get someone to talk about automobiles; I was told afterward that a half dozen suggested me right off the reel. They had all been reading about me in the papers, and I was the first one they thought of.

"Did I go?

"You can bet I went, and the News wrote up my lecture, for such talks were new then. Also I have been on committees of the News Reliability Tour for three years now. It means a lot of work, but I like it, and it gets me a lot of advertising. One day the Chamber of Commerce wanted a car to show a prominent visitor around town. I loaned the car and made a sly little arrangement beforehand so that just as we were starting out a photographer snapped the visitor. The News got that picture. Incidentally, the picture showed me and the car, but the News was willing to give me that advertising in exchange for the picture.

"And whenever a paper asks me for anything in the way of automobile stuff I try to get it for them. The News man came in one day and said he wanted to run a layout of the new season's cars in that week's automobile page. He had to have them by the next day, and he said he really would like them for the same afternoon. I said I would get them for him, and I did. I had to jump a train and run into the factory, but I got him the pictures—and say!—you ought to have seen that layout. There was nothing to it except our cars. Some of the dealers had their new models and had promised to have photographs taken, and some of them had been a week getting around to write to the factory, and it wound up by there being eight pictures in the layout, and four of them were of our cars. The fare to the factory and back was nearly two dollars. But wasn't it worth it? That much paid advertising would have cost ten. There's nothing like giving a paper stuff when they want it. The next day is always about three weeks too late. And a thing that the city editor pounds into the staff works just as well outside, and that's 'Get it in early!' Of course, I run some advertising, but so do most of the other fellows.

"But," interposed the Sales Manager, "you know yourself, Reilly, that you're some 'mixer.' Not all our dealers could make themselves as popular as you make yourself."

"Maybe not, but a lot of them would be better liked if they came out of their shells and stopped playing turtle for a while; in fact, some of them would really begin to enjoy life. A guy doesn't have to be a boozer to be a mixer. One of the best mixers I ever knew never drank anything at all."

"But how am I going to put the dealers through a course of instruction to make them good publicity getters, for"——

"There you go again!" exclaimed Reilly, with a gesture of despair. "You're always asking me how to do things like that. What are you paid for, anyway—asking me questions?"

"Well, what am I for if not to ask questions if I want to? Anyway, I'm going to make you my advisory assistant. You won't get any salary, but see the honor the title carries."

"O, fine!" was the good naturedly sarcastic answer.

"Also, I'm going to"——

"Wait a minute," said Reilly, as he made a dash for the door; "there goes one of the News fellows now, and I want to tell him something."

"Reilly," said the Sales Manager, as that individual returned, "every time I come down here on business you get me going on something else. Now, I came down for"——

"That's great! I get you going ? Who started this argument?"

"Yes," said the Sales Manager, "who started it?"

"Sure!" piped Reilly; "who started it?"

"Certainly, who started it?"

"Perhaps," said Reilly, "we'd better try to discover who's going to stop it."

"I'll stop it," said the office girl. "Mrs. Reilly's on the 'phone and wants to know if you ordered those chops for dinner. They haven't come yet."

"Tell her yes!" exclaimed Reilly, and as the girl conveyed the message he deserted the Sales Manager again and dashed across the street to a butcher shop without even stopping for a hat.

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FEW CHANGES IN STEARNS-KNIGHT

Body Lines Have Been Improved and Luxuriousness Increased, But Mechanical Alterations Are Few.

When, in July, 1912, the F. B. Stearns Co. of Cleveland, O., bodily cast out the poppet valve motor for its pleasure cars and pinned its faith to the Knight sleeve-valve engine, heads wagged dubiously, although it was plain that such bridge-burning constituted sufficient evidence that the change had not been made without mature deliberation and careful study of existing Knight engines and such minor faults as may have been present in the older designs had been corrected.

That the Stearns engineers were successful is indicated by the fact that on his last visit to American shores Charles Y. Knight, the inventor of the engine which bears his name, carried with him to his home in England a Stearns-Knight car to serve as a model, in a way, for the noted British and Continental manufacturers who first exploited the Knight engine; the concrete result has been that several of the foreign manufacturers have profited by the experience of the Stearns company and, it is said, have adopted many of the improvements and refinements of design that first saw the light of day in the Stearns factory. In view of which happy situation it has not been found necessary to make extensive alterations in the newer series of Stearns cars that now are coming through the factory—the car is, in the opinion of its manufacturers, as far advanced as it is possible ever to advance it; consequently, in its newer form, it exhibits so few alterations that they almost are negligible.

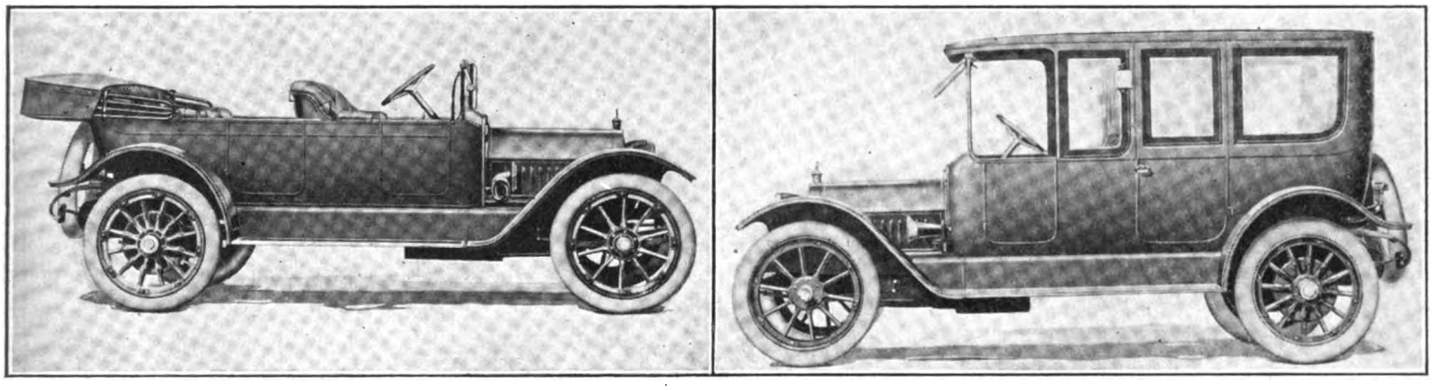
With but a single exception, the alterations that have been made are not mechanical. A Mea magneto has been substituted for the Bosch instrument that has been used in the past. The body designs have been changed slightly to permit of greater luxuriousness—the cushions, for instance, have been deepened—and the already full equipment has been rendered still even more nearly complete by the addition of an Ever Ready engine starter, which is of the mechanical type.

Hereafter the bodies are to be of the true straight-line type, the running boards having been cleared by placing the tools and spare parts in lockers, though they still are readily accessible, and the spare tires having been relegated to a position of comparative obscurity at the back of the tonneau. Further increasing the clean-cut appearance of the bodies, the doors are fitted with concealed hinges, and every outside obstruction which might tend to mar the air of smoothness of the bodies has been removed; fenders now are slightly rounded, the effect being that there is less likelihood of road dirt being thrown on the body, and the small tonneau light has been replaced by another which serves to illuminate the step at night, a switch on the right armrest controlling the lamp.

As in the past, the Stearns company ranks with those that prefer to center their attention on the construction of a single chassis, though in the newer series a choice of three wheelbase lengths is given. The roadster model is built on a chassis the wheelbase of which is 116 inches; the four- and five-passenger touring bodies are mounted on 121-inch wheelbase chassis, and the seven-passenger touring and limousine and landaulet bodies are mounted on the longest chassis—127 inches Smaller models of both the limousine and the landaulet also are supplied, in which case the 121-chassis is used. Although a six-cylinder Knight-engined car shortly will be added to the line, its appearance scarcely is likely before October.

The prices of the several models in the line includes complete equipment, as a matter of course, the Stearns company having been among the first to inaugurate the practice which within a comparatively short time has become quite general. The roadster and four- and five-passenger touring cars list at $3,750, which represents an increase of $250 over the price that last year was asked. The seven-passenger touring car sells for $3,900—an increase of $400—and the price of the limousine and landaulet is $5,000 and $5,100, respectively; $4,800 and $4,900 were asked previously. In each case the selling price includes a silk mohair top, windshield, demountable rims, Warner speedometer, Klaxon horn, complete dynamo electric lighting system, Ever Ready engine starter, robe rail, foot rests, and the usual complement of tools, spare parts, and so forth.

As the Knight engine is attaining greater favor and its ramifications are fairly well known, it scarcely is necessary to describe in detail the functioning of the cylindrical sliding sleeves that take the place of the poppet valves in an engine of the latter type. Suffice it to say that the sliding sleeves, of which there are two to each cylinder, replace the ordinary poppet valves, and inasmuch as there is no abrupt contact between the valve parts as there is in a poppet valve engine silence is obtained almost in the full and complete meaning of the word. Outside of the quietness that the valve system makes possible, however, it has another advantage in that it ensures positive action of the valves and therefore legitimately may be expected to increase the power output of the engine.



NEW SERIES STEARNS-KNIGHT MODELS IN TOURING CAR AND LIMOUSINE FORMS

Although no change from previous construction is embodied in the present design of the various component parts, it is interesting to note that through assiduous care and experiment, Stearns engineers have been successful in producing an engine which, when running "idle," or pulling at slow speeds, fires all four cylinders in their proper order. To those who are familiar with the older types of Knight engines it will not be necessary to point out that "missing" when running light, or under very light load, was one of their inherent faults, and though such trouble undoubtedly is of slight consequence provided the four cylinders fire in the proper order when the engine is running under normal load, or overload, it nevertheless constituted a source of some slight annoyance. In searching out the cause of the trouble, it was determined at the Stearns factory that it was due to a slight leakage of air around the exhaust ports which was apparent only at low speeds. By careful designing the trouble was eliminated and the manner in which it was effected constitutes one of the features which, it is said, foreign designers have adopted for their latest products.

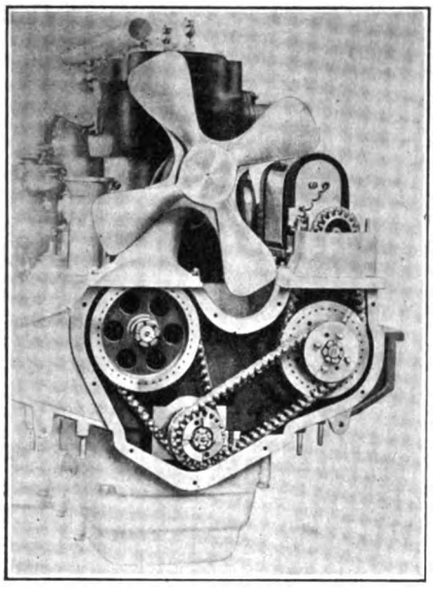
Another important improvement which was made consisted in carefully balancing the crankshaft and the flywheel, both stat-

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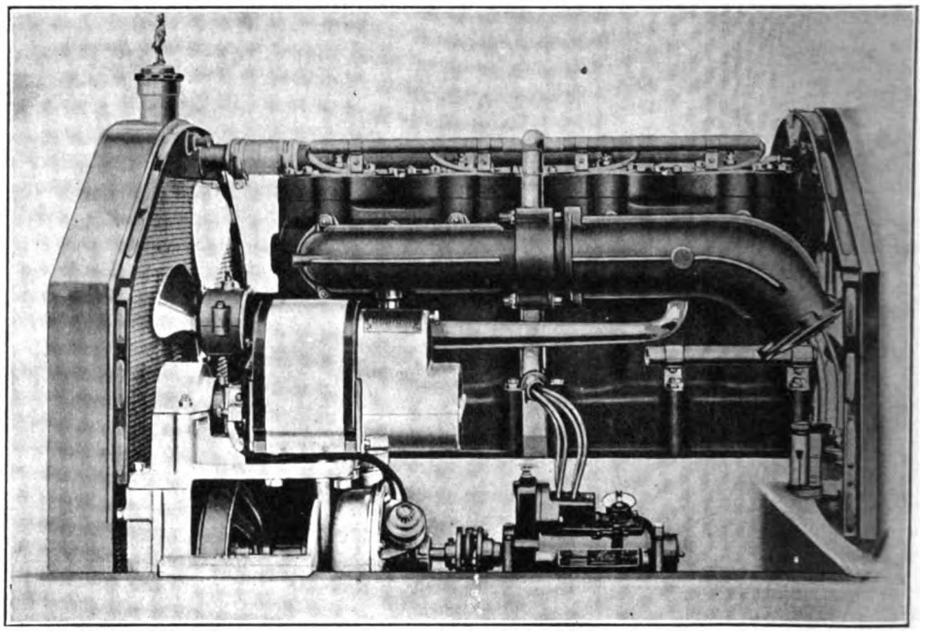
ically and dynamically, the Norton running balance machine being used for this purpose. By reason of careful balancing of the pistons and other reciprocating parts it has been found possible to reduce vibration to the point where it scarcely is noticeable even when the motor is run at comparatively high speeds. The oiling system also was slightly modified, and, though the movable trough system, which made its first appearance on Knight engines is retained, it is supplemented by an auxiliary system which is interconnected with the throttle lever and which serves to inject additional quantities of oil through the intake ports when the engine is run at high speeds or when an exceptionally heavy load is put upon it.

As heretofore, the cylinders are cast in pairs, the bore and stroke being 4¼ inches and 5½ inches, respectively. Cooling is by water, circulated by means of a contrifugal pump, which, with the shaft which takes the place of the camshaft in a poppet valve engine and the magneto shaft is driven through the intermediary of a chain of the "silent" variety. The carburetter, which quite probably forms a more important item of equipment in the case of a Knight type engine than it does in any other type, is simple in construction and is of the two jet type, one jet serving to supply mixture for slow speeds and both coming into use at high speeds when the load on the engine is heavy. As in the past, the air intake is led through cored passages in the crankcase.

From the engine, power is transmitted to the road wheels through the intermediary of a dry multiple disc clutch and a three-speed, selectively operated, change gear mechanism. The rear axle, of course, is of the distinctive Stearns type, and though unusually massive and strong is comparatively light in weight withal. The change gear system is incorporated in a unit with the differential mechanism, which naturally is mounted on the rear axle. Both sets of brakes are equalized and are located on the rear wheels; both are of the internal expanding variety and operate on exceptionally wide and large diameter drums. The springs, and, in fact, every other part of the chassis remains practically unchanged, semi-elliptic members serving to support the front and three-quarter elliptics being used in the rear.



STEARNS CHAIN DRIVE



STEARNS-KNIGHT MOTOR SHOWING DYNAMO POSITION AND DRIVE

Charges Great Graft in Business.

"There is one subject to which I most earnestly wish to call your attention, and when I speak of it I hope I shall not be charged with an assault upon the windmills, nor be called a Don Quixote, a theorist or a dreamer," said Hal. H. Smith, of Michigan, in an address recently delivered to the Kentucky Manufacturers Association at Louisville. "I refer to the struggle now at hand in the manufacturing business of the country to maintain the simple idea of honesty.

"For a long time, as American business grew and flourished, it was the boast of our business men that American industry was honest industry; as to enterprises, we yield the palm to no man upon the face of the globe, but we insist that its competition was always honest competition. That competition, so aggressive as it was, gave birth as it increased in vigor, in dishonest minds to insidious and dishonest practices and today the system of graft and commissions—and, I think the word is not too hard, of thievery—is eating the heart out of one industry after another with scarcely any abatement.

"The history of the growth of these conditions from the commission paid to introduce the goods through dishonesty in the sales department to rotten quality and to downright theft and dishonesty, is logical, steady and rapid. It is condoned by us in its early stages in an enterprising salesman, but when it appears to our own buyer, it is the cause of the most serious and the gravest alarm. Its effect, whether practiced in the selling department or in the buying department is alike vicious and demoralizing. Everywhere it promotes dishonesty, and its vile touch contaminates every clerk, every salesman, every worker, then the manager, and finally the whole structure of the business. Its course runs rapidly and like a leprous disease, it can rot in a decade an entire industry.

"Who today will deny the conditions of the varnish trade or contend that nine-tenths of that great business is not based upon the bribery of the buyers? Who knows how far on the road to the same wholesale contamination any other of our modern manufacturing industries already has gone?

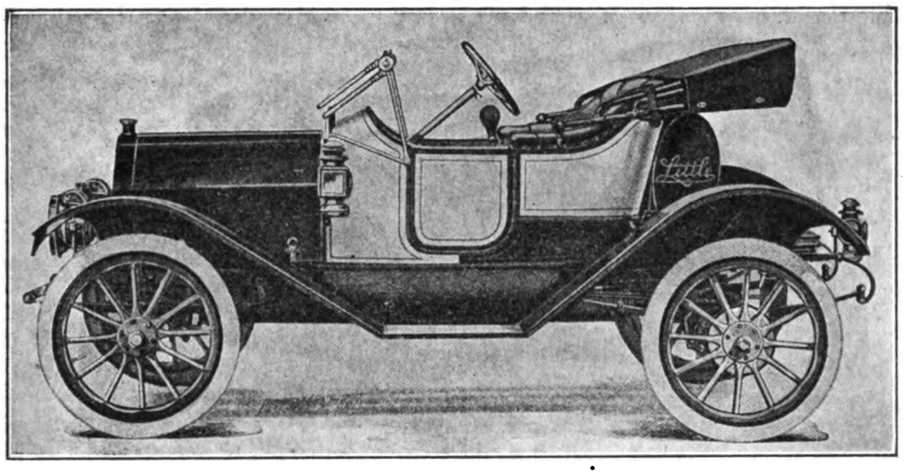
"He is a fortunate manager today, who, as he sits at his desk and scans has invoices, knows how much of that price is not to cover the cost of corruption of his own employes, or who can say when he knows the degradation of the product that he buys, that the degradation has not been condoned and winked at by the buyer who has in his pocket the commission of the seller. It would be bad enough if the result of this growing system of graft were to corrupt buyers and salesmen and send managers uneasy to their work too weak to resist the pressure of the demands of more business, but even if they do not openly approve it, the managers in a short time themselves must yield to the blight, for there is no way to recoup these added expenses, except by shoddy quality and fraudulent manufacture, and so, from the salesman and the buyer to manufacturer and the owner all have become accomplices in the fraud and partners in the crime."

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"LITTLE FOUR" IS NOT SO LITTLE

It Is for Only Two Passengers, However—Has Sliding Gears, Unit Power Plant and Other Modern Features.

In developing the "Little Four," which is produced by the Little Motor Car Co. of Flint, Mich., the destiny of which is controlled by W. C. Durant, whose latest venture, the formation of the Republic Motors Co. of Delaware, a $65,000,000 parent company with 10 subsidiary companies capitalized at $1,500,000 each in as many States, was launched for the specific purpose of marketing this car and the products of the Chevrolet Motor Car Co. of Detroit, it has been the purpose of the manufacturers to produce a vehicle to sell at a moderate price



LITTLE "FOUR" ROADSTER WHICH SELLS FOR $690

—or, rather, at a low one—in which are incorporated many of the features heretofore found only in cars which sell for considerably more. Though but the one model at present is produced, the line eventually will be completed by the addition of a "Little Six" which is to sell for close to $1,000. Already the latter car is well in hand, and it is expected that it will be placed on the market before the snow flies. The four-cylinder model lists at $690 f. o. b. the factory.

Giving evidence of the bigness of the Little car, the motor, clutch and gearset are combined in a readily removable unit, the same feature of simplicity and extreme accessibility being apparent throughout the whole of the car. The motor is of the standard vertical four-cylinder four-cycle vertical type with the cylinders cast in pairs and cooled by water circulated by the thermo-siphon system in conjunction with a fan. The valves all are on the same side; the bore and stroke are 3½ inches and 3⅛ inches, respectively. The nominal horsepower rating is 20, though by reason of large valves and careful workmanship throughout considerably more power than the rating indicates has been generated without difficulty. Ignition is effected by means of a high tension magneto with spark timing lever located on the steering column and a Kingston carburetter which has been developed especially for the motor supplies the "mixture." The motor is lubricated entirely by splash, a reservoir which is bolted to the side of the crankcase serving to maintain the oil in compartments beneath the connecting rod big end bearings at the proper level.

By way of ensuring smooth and positive action, the clutch employed is of the cone variety and provides liberal engaging surface; the male member is faced with Raybestos. The change gear mechanism is selectively operated by means of the orthodox side hand lever and provides two speeds forward and reverse, the gears being nickel steel and the shafts mounted in liberal bearings. A shaft with a single universal joint serves to transmit the power to the semi-floating rear axle, efficient transmission being ensured by the generous use of Hyatt roller bearings. The standard gear ratio is 4 to 1. The front axle is tubular in section and the reach and tie rods are placed above and behind the axle, respectively.

Two sets of brakes are provided, and both of them are located on rear wheel drums of large diameter and face. The emergency set is operated by means of a side hand lever and the service set is operated by means of the usual pedal. The frame is of channel section pressed steel and is supported in front on semi-elliptic and in rear on three-quarter elliptic springs. Both front and rear wheels are shod with 30 x 3 inch Goodyear clincher tires, the standard wheelbase being 90 inches.

But a single body style is supplied, and this is a two-passenger roadster of attractive appearance and clean lines, painted in gray, the more or less somber hues of which are relieved by nickel trimmings. Included in the standard equipment, which is more than ordinarily complete, considering the moderate price of the car, are mohair top with hood and curtains, windshield, five lamps, Prest-O-Lite tank, horn, jack, tools and spare parts.

SPEAKS UP FOR THE FLAT-TOP DESK

And in Doing So, Gulick Finds Food for Sermonizing—Obtaining the Best Results from Men's Work.

"Not long ago in the office of a leading American publishing house I noticed that the roll-top desks had all been removed, and that instead, the entire force, from stenographer to head of department, sat before desks with flat tops," says Luther M. Gulick in the "Ford Times." "When I asked about it, they said:

"It expedites business. Take the case of a claim that must be passed along from one hand to another until it has been corrected and O. K.'d five different times. Now, if that claim can get stuck in a pigeon-hole anywhere—a thing that used to happen right along—it's likely to be forgotten. The result is delays and confusion and ragged business generally. But if there are no pigeon-holes and it has to lie in plain view on top of the desk, it can't be forgotten until it is attended to.'

"'But it must make a mess on the desks,' I objected.

"'That's the very point,' was the answer. 'No chance for a mess. We get things cleaned up.'

"For those who have ears to hear, the flat-top desk has a moral. It stands for a principle which is applicable throughout one's natural life. It stands for definite, clearly marked stages—stopping points—breaking-off places.

"One of the most distinguished alienists of the present day has made the observation that among the untransmitted causes of insanity none counts for more than the big idea, the idea that can never be fully made over into concrete reality for the very reason that it is too big. The far-reaching scheme, the still unsubstantiated venture, the revolutionary theory, the momentous but unperfected invention—all have it in them to take possession of a man; they hold him day and night; he can't get away.

"The man with the small everyday ideas keeps his balance not primarily because his nervous system is of a more stable character—though that may be true, too—but chiefly because his little ideas work out directly and successfully; he can get them done with and out of the way. His jobs are finishable. He enjoys good mental health.

"Big problems can be split up. They are always reducible to fractions—at least for practical purposes they are—and each fraction can be dealt with separately. We do not need always to keep ourselves staring at the whole, worried by its magnitude and its difficulty and its imperative claims.

"Taking one's work in reasonable 'stints' is the thing I am recommending; bundles of work that can be finished. Set yourself at some definite subdivision of the total

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problem; something that you are able to put through in a piece; and then put it through. Make the breaking-off place sure. When you reach that point, you have a specific accomplishment to your credit; and that's an encouragement for the thing that's ahead.

"If you have ever gone on walking expeditions you know how important it is to make goals. Suppose it's a tramp of 300 miles or so that you are setting out on. Your first impulse, especially if your time is limited, is to walk as far as your strength allows each day. But that does not work. Every afternoon you have to decide afresh when you have really reached the fatigue-point. Perhaps you are not quite tired enough to stop yet, you think. On the other hand, perhaps you are. How determine? You think of the hundreds of miles still to be covered, and you decide to keep on a while longer. A day comes when you are excited, or unduly ambitious, and, without perceiving it at the time, you overwalk yourself. The subsequent night you do not rest; fatigue becomes cumulative; and your pilgrimage is likely to end in disaster.

"Fatigue does not come so quickly when you have set your eye on a certain definite point of attainment, something you know to be within your compass. The proximate goal is as much a psychological necessity as the ultimate goal.

"When you quit your desk at night with the assurance that everything has been brought to a definite stopping place, and that to-morrow you'll know just where you stand with reference to the day's work, you can really rest. It's a very different state of mind from the one that comes when you pull down the cover over a mussy array of odds and ends, and run.

"It's precisely this repose that gives you the first lien on to-morrow. You have a chance to stand off and take a look at things and size them up. You can estimate cash values.

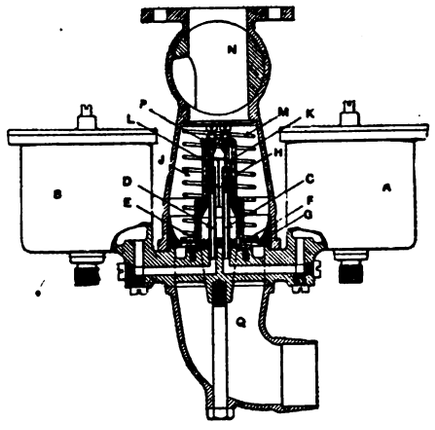
"The greater the pressure under which a man works—the greater the actual count of his responsibilities—the more essential it is that he should be able to get away from them. The consciousness of freedom is a thing that stays there in the back of your mind, even when you are smashing and driving away at your work; and it's a saving knowledge. It brings confidence, helps you keep your balance—this sureness that there's a rest time ahead which nothing short of fire or flood and another break in stocks can disturb.

The flat-top desk cleared of the day's debris, clean and fresh for to-morrow's new duties, or for its new installment of old duties, is a symbol worth bearing in mind. The brain of the man who has taken its moral to heart keeps fresh and clear because it earns its night's repose. The joy of success is in just this daily conquest of definite problems; and every such conquest is an inspiration for the next one.

MIXING GASOLENE AND KEROSENE

Englishman Applies Himself to the Task and Ingenious Carburetter Results—How Chief Problems Are Handled.

Having tired of experimenting with devices calculated efficiently to carburate air with kerosene, only mediocre results having been obtained despite concerted action on the part of no inconsiderable number of investigators, at least one British inventor has attempted to emancipate his fellow motorists from the excessive and still climbing price of fuel by the simple expedient of combining "petrol" and paraffin (or gasolene and kerosene) in such a manner as to make their use not only simple but more than ordinarily advantageous. And so successful has he been, it is claimed, that it



HAMILTON BI-FUEL CARBURETTER

has been found possible in practice to operate an engine on 60 per cent. gasolene and 40 per cent. kerosene, the ultimate result being, of course, a substantial saving in fuel bills. As a matter of fact, it is further pointed out that when the whole or a considerable portion of the induction pipe is water jacketed even better results—and, incidentally, better economy—is obtained when the proportions of "petrol" and paraffin are just reversed.

Needless to say, the device for which the claims are made is a member of the carburetter family; it is styled the Hamilton bi-fuel carburetter. Although it may appear that by reason of the different specific gravities of gasolene and kerosene difficulty would be met in effectually mixing them so as to form, with air, a proper firing charge, and such is the case where any attempt is made to mix the two fuels in their liquid state, the inventor of the Hamilton carburetter has overcome this trouble by providing two separate float chambers and two needle valves and mixing the two fuels after they have been made into gas through the agency of heat and a column of rapidly moving air. Obviously, the proper functioning of any such device depends to a great extent on the necessity for maintaining constant suction on both jets, regardless of the speed of the engine and the size of the throttle opening, and this problem, like the other, has been worked out in an ingenious manner, as may be seen by the accompanying part-sectional drawing of the carburetter.

The two float chambers (A and B) are located on either side and communicate with their separate fuel jets (K and L), which are located in the choke tube (H). The air inlet is at the base of the mixing chamber and practically forms a ring around the two jets. When the air valve (F) between the air inlet and the mixing chamber is closed, only a comparatively small amount of air is permitted to pass through the carburetter, passage being provided by means of the ports (E); all the air therefore must pass through the choke tube (H). The seat (G) on which the air valve (F) is held by means of a helical spring is formed in the lower part of the mixing chamber (J). This seat is formed and curved so as to graduate the flow of air between it and the air valve, as the latter rises under the increasing suction caused by increasing engine speed, in such proportion to the travel of the valve that the negative pressure in the mixing chamber (J) remains practically constant.

The air valve, however, really is more than a mere flat annulus, for it is carried upward to form a bridge piece (P) above the choke tube, and in this bridge piece the needle valves (K and L) are held in such a position as to regulate the flow of fuel through the two jets. Incidentally, they screw into the bridge piece and are held by small lock-nuts, their adjustment thereby being provided for. In setting the carburetter, and in describing its action no better method can be used than to explain its adjustment, the needle valve controlling the kerosene is screwed down until the flow is shut off. At the same time, the needle controlling the supply of gasolene is adjusted so as to permit the passage of just sufficient fuel to carburate the air which can pass through the choke tube. With this adjustment the same conditions obtain as would obtain if the engine were running on a pilot jet, the supply of mixture being sufficient for running under no load or for starting. Immediately the throttle is opened, the increased suction in the mixing chamber raises the air valve (F), which automatically increases the size of the gasolene outlet and at the same time opens slightly the kerosene valve. The relative flow through the gasolene and kerosent jets is determined and set in the first place, of course, so that the proportions of the two fuels in the mixture remain practically constant over a wide range of engine speeds.

Small coiled springs are easily weakened by the action of rust, and for this reason particular care should be taken to keep them free from moisture. A little oil or grease should be applied to the steel.

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REVISION OF THE LOCOMOBILE LINE

Longer Stroke for Larger Six-Cylinder Model and New Bodies for All—Electric Lights Made Standard.

In working out the refinements which mark the latest edition of the Locomobile line, it is significant that in the largest model—the "6-48," which made its appearance as the first six-cylinder Locomobile product two years ago—the tendency toward longer stroke which became apparent when the second Locomobile "six" was brought out about a year later, has been followed in the larger model as well. Except for this difference, which has increased the stroke from 4½ to 5½ inches, and several other slight changes which nevertheless bear direct influence on efficiency, the Locomobile Co. of America, of Bridgeport, Conn., has seen no occasion for altering designs which over a considerable period of service have proven eminently satisfactory. Even less change has been made in the "little six," which is logical in view of the company's experience with the older six-cylinder model and the comparative newness of the later one, and the four-cylinder 30-horsepower model is continued with scarcely a mechanical alteration worthy of note. As in the past, these three cars comprise the Locomobile line.

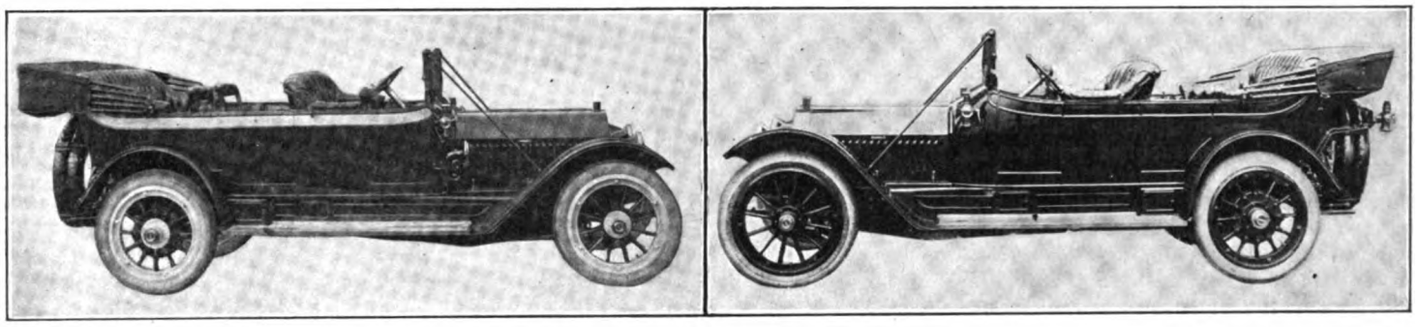
Despite the camparative scarcity of mechanical alterations, however, changes in body design and construction are fairly numerous, and as is the case with so many other manufacturers whose efforts at improvement now must be centered on bodywork, for the reason that mechanical perfection has been so nearly reached as to make further search unnecessary, the coachwork has been rendered even more beautiful and more luxurious in character than that which has marked previous Locomobile products. Not only have the various models been refined and smoothed down but the equipment has been increased to the point where the intending purchaser actually can find little to desire.

By way of affording a continuity of outline which shall blend well with the lines of the hood and fenders, all bodies now are fitted with aluminum cowl dashes, which serve the additional purpose of providing greater protection for the occupants of the front seats. The effect of the unbroken lines has been further increased by placing the gear shift and emergency brake levers within the front compartment where they are within easy reach of the driver's right hand. Incidentally, door handles have been eliminated and the hinges are of the concealed variety. Though no labor or expense has been spared to make the open types of cars beautiful as well as serviceable, efforts to these ends are, perhaps, more noticeable in the case of the closed cars. Cushions have been made even deeper and more luxurious and the exposed metal parts which heretofore have been finished in brass, now are finished in sterling silver.

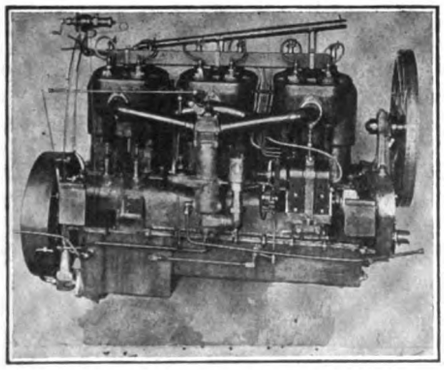
Giving evidence of the thoroughness with which the manufacturer has worked, the equipment of all the models now includes a complete dynamo electric lighting system in addition to an engine starting device. The latter is of the acetylene type and its quality is assured by the nameplate Disco. Another important addition to equipment which is calculated to render the labor of driving materially less arduous is the location of a power operated tire pump on the change gear mechanism. The pump is driven from the lay shaft and is in operation only when the tires require inflation, a small lever at the side of the chassis serving to connect and disconnect it. A folding glass windshield also has been added as a feature of standard equipment, the remainder of the list including: Top, demountable rims, with an extra rim and tire holders, storage battery, tools, horn, robe and foot rests and spare parts.

Mounted on the three chassis there will be several body styles, including roadster, touring, limousine and landaulet, which are fitted to the "6-48," the same line including a Berline limousine which is fitted to the "6-38," and similar bodies on the well-known and well-tried four-cylinder 30-horsepower model.

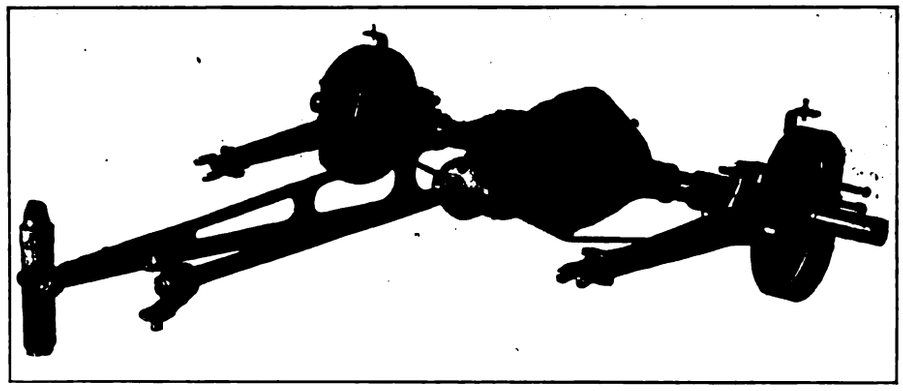
By reason of the increase in the stroke of the larger six-cylinder motor, the nominal rating of 48 horsepower really is nominal. Even when the stroke was but 4½ inches—the bore remains the same at 4½ inches—the actual power output of the engine was considerably in excess of 48 horsepower, but now that the stroke has been increased to 5½ inches, it is pointed out that at 1,800 revolutions a minute as high as 82 horsepower has been developed on brake test. Obviously, 1,800 revolutions



TWO SIX-CYLINDER LOCOMOBILE MODELS—THE "6-48" AND THE "LITTLE SIX"



INTAKE SIDE OF "6-48" MOTOR



LOCOMOBILE REAR CONSTRUCTION SHOWING TORSION AND RADIUS MEMBERS

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is not excessive speed for a well-constructed engine, from which it may be gathered that 82 horsepower, even, is nominal. Of course, merely increasing the stroke of the engine has not been entirely responsible for the increase in power. The valves also have been increased in size, as have the intake and exhaust passages. Incidentally, though no actual increase in power may have resulted from the change, greater quietness and positiveness of action surely accrues, the valve mechanism has been altered slightly, a new style of valve lifter and guide having been adopted.

Another factor which has a material bearing on power output is the addition of a new style carburetter which has been developed particularly for this engine by the Locomobile engineers. It differs from the carburetter used in the past primarily in that it has a slightly larger throat, thus permitting a more homogeneous mixture of the fuel and air. It is supplied with hot air intake and the usual hot water jacket. The ignition system also has been slightly changed, though the change embraces only the substitution of a six-magnet instrument for the one formerly used. Similarly, the lubrication system has been refined in detail, the gear pump which circulates the oil now being driven from the intake valve camshaft instead of from the exhaust camshaft. The oil level petcock has been shifted to the other side of the engine, also, thus increasing accessibility. The cooling system, including both pump and radiator, has been slightly increased in size to obviate the possibility of the motor overheating even under the most adverse circumstances. By reason of the addition of the electric lighting dynamo, which is driven from the magneto shaft, a slight change in the position of the water pump and the shape of the water manifold has been necessitated.

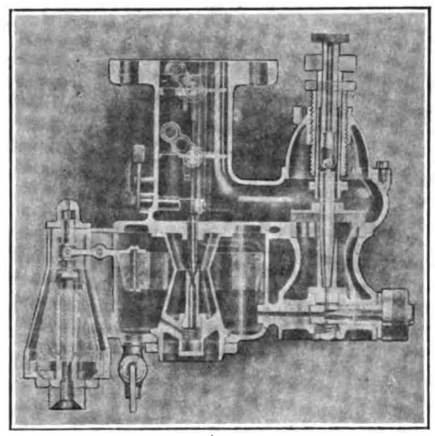
In the two smaller cars in the line—the "6-38" and the "4-30"—the changes in construction which have been made scarcely could be found with a magnifying glass so slight are they. The bore and stroke of the "little six" remains the same, namely, 4¼ x 5 inches, the same figures in the case of the "four" remaining 4½ x 4½ inches. The other essential elements, the clutch and the change gear mechanism, are unchanged, the four-cylinder model being equipped with a three-speed selectively operated gearset and both of the larger models being equipped with four-speed gearsets. The clutch in each case is of the multiple disk type, embracing a large number of special saw steel plates.

All the rear axles are of the full-floating type and in each case two sets of independently operated brakes located on rear wheel drums are provided; both sets are carefully equalized. Conforming to standard practice, springs are semi-elliptic in front and three-quarter in rear, the wheel diameter being 36 inches in each model and the cross section of the tires varying according to the size of the car and the carrying capacity of the body.

TUBE MEN TAKE UP CARBURETTER

Build Special Factory for Its Manufacture "Feps" Marked by Absence of Springs, Cams, Etc.

Despite the fact that carburetters already are manufactured in great variety, the carburetter manufacturing business seems to have lost none of its allurement, as is evidenced by the fact that a number of well-known concerns recently have turned their attention to this branch of the motor car industry. Among these is the Schoen-Jackson Co., of Media, Pa., which has undertaken to manufacture a carburetter invented by J. L. Fritz. Schoen, who is



FEPS CARBURETTER IN SECTION

well known through his connection with pressed steel car construction and the manufacture of pressed and rolled steel car wheels, and whose company manufactures flexible metallic tubing, long has been interested in the carburetter problem, and was instrumental in acquiring for his company the exclusive rights to the new carburetter, a complete plant for the manufacture of which has been erected adjoining, but entirely separate from, the tubing works at Media. The device is styled the "Feps" carburetter, the name being composed of the initial letters of the magical words flexibility, economy, power and speed.

The carburetter, which is shown in section in the accompanying illustration, differs from most of those now on the market, in that it is entirely devoid of springs, balls and cams. There are two jets, one, which is used for low speed running, being in the throat of a venturi tube and having an opening which is adjustable by means of a needle valve, and the other, for high speed and power, operating in conjunction with a leather-seated air valve actuated by the suction of the motor. An extra rich mixture is formed by the carburetter for starting, with the result that the difficulty of getting the motor under way in cold weather is said to be greatly reduced, if not practically eliminated. It is claimed for the Feps carburetter that it is exceptionally satisfactory in its operation at low speeds; that it will not cause back-firing or "loading up" when the throttle is opened suddenly, and that its accelerating qualities and economy of fuel are decidedly unusual. It is further claimed that weather changes have no effect on the quality of the "mixture" produced and that adjustments once made are permanent because there are no parts which can become worn or change their adjustment with use.

Tire Problem Tackled in New Fashion.

Apparently having tired of endeavoring to produce fearful or wonderful concoctions to take the place of air in the ordinary pneumatic tires, at least one British subject has tackled the problem of increasing tire life in a novel manner—a manner so novel, in fact, as to cause conjecture regarding its ultimate utility. J. H. Messinger is the man who has attempted to shift the white man's tire burden, and his method is delightfully simple on paper, even if it may cause experienced tire manufacturers to scratch their heads in perplexity in an effort to produce, practically, the tire that is covered by Messinger's patent specifications. The design pertains principally to the inner tube, which is made with a specially corrugated exterior surface and is strengthened in the recesses by means of fabric bands. Briefly, this construction is calculated to cause the tube to retain its shape when inflated and also to permit of a constant circulation of air between the shoe and the tube, the purpose being to reduce the temperature of the rubber and thus to increase the life of the tires. Despite elaborate precautions to carry off the heat, however, the tread of the shoe is described as being composed of a series of "steel-studded knuckles or protruberances which are continued along the sides of the cover at an angle of 45 degrees and are lost at the recess of the bead, while alternate oval ribs terminating at the edge of the tread proper are provided to give strength and to disperse disintegrating stresses." The number of plies of canvas also is reduced, the place of this material being taken by an inner lining of chrome leather which is vulcanized in place by a secret process. Nothing is said about the method of providing for the ingress and exit of air to the corrugated inner tube, despite the fact that the establishment of the circulation is the principal object sought.

Metal Polish that Saves Elbow Grease.

A recipe that may be classed as a "labor saving device" is one for a metal polish which has only to be applied to the surface to be polished, wiped off, and the metal touched up a little with a soft cloth. It is made of two parts of alcohol and one of ammonia, in which is stirred enough carbonate of lime to make a cream. The alcohol and ammonia dissolve the dirt and tarnish and the lime absorbs them, leaving the surface clean. The mixture should be allowed to dry before it is wiped off.

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ATTACKS MICHIGAN DRASTIC LAW

Metzger Appeals to Highest Court from Decision Mulcting It for Joy-Riding Employe—Points Involved.

Michigan's remarkable law, which makes the owner responsible for any damage caused by his car regardless of who may be driving it, has been brought to the attention of the Supreme Court of the United States by the Metzger Motor Car Co., of Detroit, which has suffered because of the drastic enactment. Its constitutionality is attacked.

"Joy-riding" is the basis of the Metzger appeal to the highest court. According to the evidence, one of the Metzger employes on July 12, 1910, after driving the general manager of the company to the railway depot, turned about and "made a night of it," using the company's car for the purpose; and, as so often happens, he smashed into a horse-drawn vehicle, inflicting injuries which caused a Detroit jury, on December 9, 1911, to award the horseman $1,843 damages. He had sued for $5,450. It was charged that the car was being operated at a rate of more than 25 miles per hour, without having its front lamps lighted, which latter fact is admitted, although it was brought out that the side lamps were aglow.

At the trial, counsel for the defendant urged that there was nothing to show that the automobile which caused the accident was being used by the driver or drivers of the company, on the business of the company; that from the undisputed evidence it was shown that the persons operating the car at the time of the accident were not operating or using the car for the business or interests of the company, nor was there any evidence to show that any permission had been obtained from the company for the use of the car in any capacity whatever, and that it was being operated without the consent or knowledge of the owner.

It was further urged that if the plaintiff could recover at all it would be under Section 10 of Act No. 318 of the Public Acts of 1909 of the State of Michigan, entitled "An act providing for the registration, identification and regulation of motor vehicles operated upon the public highways of the state and to the operators of such vehicles," but it was also urged that this Subd. 3 of Sec. 10 is in violation of Section 1 of the 14th Amendment of the Constitution of the United States and that it deprives the defendant of property without due process of law and also that it denies it the equal protection of the law.

The car was taken out without any pass and contrary to the rules of the company, which were to the effect that the watchman should not allow anyone with a car to pass outside during regular working hours except the regular testers without a written pass from the superintendent or some one acting in his stead; it was also against the rules of the company for a machine to be taken out during the day and remain out over night except in those rare cases where it was necessary to do night work, and even as to the testers, they are required to get permission as to the courses they are to take in testing out a machine and the length of time to be given to the tests. In this particular instance the car had been taken out to drive the general manager of the company to the station and then had not been returned, and this was brought out in the charge to the court when the judge said it was perfectly plain that the man Cotter, driver of the machine at the time of the accident, was taking his own friends out for a drive, perfectly clear that he was not on the company's business and that he had no business to be using the car at that time, and that he was on his own affairs.

The judge, in his charge to the jury, further said that, while he, or even the jury, might feel that the statute under which they were expected to bring in the verdict might be unconstitutional, still, until it had been passed upon by some higher tribunal, they—the judge and jury—would be compelled to administer under its provisions.

The excepts made at the time are as follows:

First—The defendant excepts to the refusal of the court to give to the jury its first request to charge, which is as follows: "Under the pleading and proofs the plaintiff cannot recover, and your verdict must be for the defendant, no cause for action."

The defendant excepts to the refusal of the court to give to the jury its second request to charge, which is as follows: "I charge you as a matter of law that under the common law the plaintiff is not entitled to recover against the defendant in this case, inasmuch as there is no showing that the automobile which caused the accident for which suit has been brought was being used by the driver or drivers of the same on the business of the defendant company."

The defendant excepts to the refusal of the court to give to the jury its third request to charge, which is as follows: "I charge you that it appears from the undisputed evidence in this case that the person or persons who were operating the car were not operating or using the same for the business or in the interest of the defendant company."

The defendant excepts to the refusal of the court to give to the jury its fourth request to charge, which is as follows: "I charge you as a matter of law that there is no testimony in the case that there was any permission granted to the driver of the car in question to use the same for any purpose whatsoever or that while operating same he was doing so with the consent of the defendant company."

The defendant excepts to the refusal of the court to give to the jury its fifth request to charge, which is as follows: "I charge you as a matter of law that if the plaintiff could recover at all in this case it would be by virtue of Subd. 3 of Section 10 of Act No. 318 of the Public Acts of 1909 of the State of Michigan, entitled 'An Act providing for the registration, identification and regulation of motor vehicles operated upon the public highways of the State and to operators of such vehicles.'"

The defendant excepts to the refusal of the court to give to the jury its sixth request to charge, which is as follows: "I charge you as a matter of law that Subdivision 3 of Section 10 of Act No. 318 of the Public Acts of 1909 of the State of Michigan is in violation of Section 1 of the Fourteenth Amendment to the Constitution of the United States."

The defendant excepts to the refusal of the court to give to the jury its seventh request to charge, which is as follows: "I charge you as a matter of law that Subdivision 3 of Section 10 of Act No. 318 of the Public Acts of 1909 of the State of Michigan is unconstitutional, for the reason that it abridges the privileges of citizens of the United States and of this defendant, and further, that it deprives the defendant of property without due process of law and also that it denies it the equal protection of the laws."

The assignments of error on which the case is taken to the Supreme Court are as follows:

1. The court erred in submitting the case to the jury.

2. The court erred in denying the defendant's motion to find that there was no cause for action and to dismiss in favor of the defendant.

Seven other causes for error are the various excepts previously quoted.

In the natural course of events, and unless the case is placed forward on the docket, it will be a matter of possibly three years before it will be reached.

Why the Boarding House Lady Filed Suit.

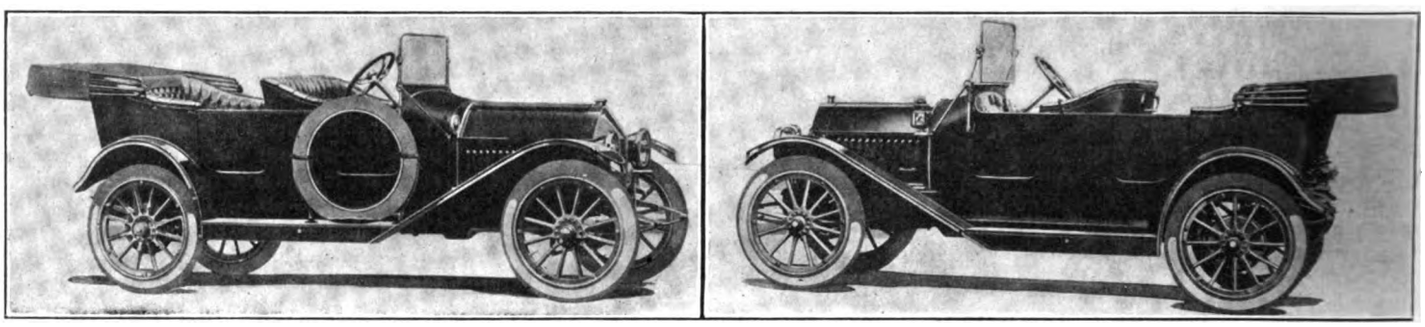
Just because a second-hand automobile which she purchased with the idea of making an extensive tour in search of a new location to establish a boarding house broke down when she was far from home and necessitated a lengthy railroad journey, Mrs. Clara McGraw, an erstwhile boarding house keeper of Milwaukee, Wis., has started suit against the Franklin Auto & Supply Co. in an effort to recover her railroad fare and sundry other expenses which she alleges were incurred through no fault of her own. The amount she asks for is $950. According to the testimony in the case, Mrs. McGraw purchased a second-hand car from the Franklin company and, although it was affirmed by the defendant to be in good condition, Mrs. McGraw says that it was "entirely dilapidated and utterly unfit" and that after it had been driven but a short distance it broke down completely.

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TWO NEW MODELS IN JACKSON LINE

They Are Styled "Majestic" and "Olympic" and Both Have Long Stroke Motors—Distinctive Characteristics Retained.

Refinement of the Jackson line, which is produced by the Jackson Auto Co., of Jackson, Mich., scarcely can be termed refinement at all, for although many of the inherent characteristics of previous models have been retained, the two cars which for the coming season will be the leaders practically are new cars all the way through. Both are four-cylinder models, and though the line eventually will be rounded out by the addition of two more models, one of them a lighter "four" and the other a "six," neither has as yet put in an appearance, nor will they do so, for at least two weeks to come.



TWO NEW JACKSON MODELS—THE MAJESTIC AT $1,850 AND THE OLYMPIC AT $1500

For the two new four-cylinder models, the manufacturers have chosen the names "Majestic" and "Olympic" as being indicative of the character of the cars, the lines and appointments of which are such as to suggest the acme of comfort coupled with the strength and reliability that long has been a feature of Jackson cars. Particular attention has been devoted to the body work with the view to producing easy riding qualities to which only the superlative degree of any adjective legitimately may be applied. To this end, the full-elliptic springs which in the past have served as one of the distinguishing marks of the line, are retained. Incidentally, the tire sizes have been materially increased, which in addition to increasing the comfort of passengers tends to reduce upkeep cost, for it is a comparatively well-known fact that large tires are conducive to tire mileage.

Needless to say, both the new models are fully equipped, the list including Disco engine starter, top with dust cover, windshield, speedometer, demountable rims with extra rim and tire carriers, oil and gasolene gauges on the dash and the usual complement of tools, spare parts, etc. In addition, the "Majestic" is lighted throughout by electricity furnished by a dynamo system and a storage battery.

The "Olympic" model is equipped with Prest-O-Lite tank and an automatic head lamp lighter by means of which the lamps may be lighted from the dash. The "Majestic" is the larger of the two and lists at $1,850; the "Olympic" sells for $1,500.

Except for a difference in the motor sizes in the two models, they are practically alike. The larger is equipped with a motor which is rated at 45 horsepower and in which the bore and stroke are 4½ inches and 5¼ inches, respectively, and the smaller is equipped with the same type motor, in which the bore and stroke are 4⅛ and 4¾, respectively. The motors in each case are practically duplicates, the cylinders being cast of close-grained gray iron in pairs with the valves all located on the same side, where their enclosure by means of light aluminum covers is rendered simple. Crankshafts are of the three-bearing type. Ignition is by means of high tension magneto and the cooling system is a combination of thermo-siphon and pump which has been adopted by reason of its efficacy in maintaining the temperature of the cylinders at the proper degree, regardless of the work imposed upon the motor. The lubrication system is self-contained and is of the constant level splash type.

In recognizance of the advantages which accrue from rigidity of construction, the motor and the change-gear mechanism together with the clutch form a unit, the latter two elements being enclosed in a single housing which is dust and dirt and oil proof. The clutch is of the leather-faced cone type and the gearset is selectively operated and provides three speeds forward and reverse. Both of the shafts in the change gear mechanism are carried in liberal sized ball bearings. Wherever practicable the other elements in the transmission system are mounted in ball or roller bearings, the concrete result being that the maximum possible amount of power is transmitted directly to the rear wheels. The rear axle is of the full-floating type and is mounted in roller bearings with ball thrust bearings. The front axle is of the orthodox I-beam pattern with the tie rod behind, where it is fully protected, and the reach rod above, where it also is protected.

In the larger model—the "Majestic"—the wheelbase is 124 inches and the wheels are shod with 36 x 4 inch tires both front and rear. The smaller model is built on a wheelbase of 115 inches and 34 x 4 inch tires are fitted both front and rear, the rims in each case being of the quick-detachable demountable type. The tread in either case is standard—56 inches—though for Southern touring 60 inches may be had at the option of the purchaser. Both cars are finished in black enamel and nickel plate where the metal parts are exposed, the body of the "Majestic" being finished in dark blue and the body of the "Olympic" being finished in dark maroon.

Dean Produces an $8 Electric Horn.

Adding to the keen competition caused by the several recently developed moderate-priced electric signal horns, the Dean Electric Co. of Elyria, O., just has brought out a new horn of that type which is styled the Rexo and sells for $8. Despite the comparatively low price of the horn, however, its construction is quite similar to that of the Tuto and Tutoette horns which are made by the same company, and the mechanism is of the same substantial character. It differs from its prototypes, however, in that it is capable of producting but a single warning tone, though the quality and volume of that note are calculated to be almost, if not quite, as effective as the dual tones of the older products of the company. The new horn is designed to operate on a six-volt circuit and its winding is such that the current consumption never exceeds 1.8 amperes. Like the Tuto and Tutoette, the Rexo contains no internal moving parts which require frequent attention and lubrication, for which reason, it is pointed out, indefinite service without diminished efficiency is one of its paramount features. It is made in two types, the one for use after the orthodox manner, outside the engine hood, and the other for location beneath the bonnet.

Transferring Garage Grease to Car Rugs.

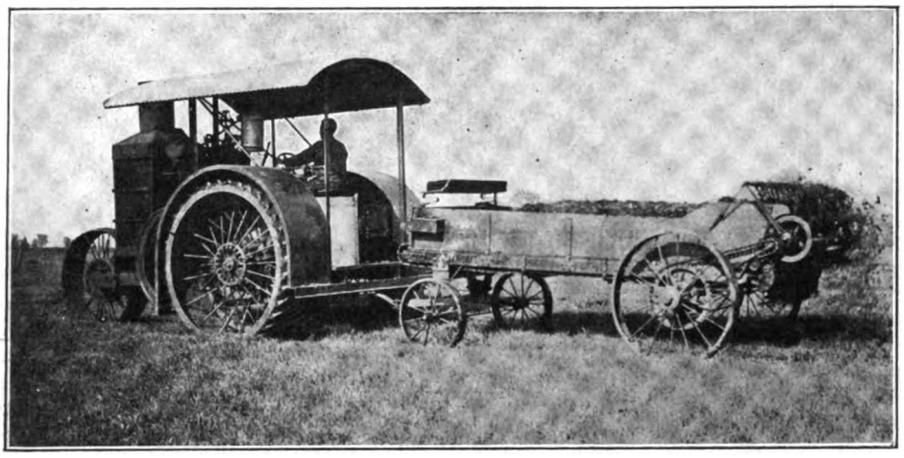
While the floor of a garage is not usually supposed to be particularly clean, the floor covering of a car is, at least by the owner. The too common habit of car polishers or other garage employes of tramping over the tonneau floor with shoes freshly decorated with grease from the garage floor is one that means ruination—or, at least, frequent cleansing—of the carpet or rug, and annoyance to the owner.

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MODERN METHODS OF PLOWING WITH GASOLENE AND OIL

Characteristic Features of the Modern Equivalent of Yoked Oxen—Driving Systems With Two Wheels, Four Wheels and Chain Tracks That Give Enormous Tractive Power—Wherein the Internal Combustion Motor Is Superior to Steam for Farm Work on a Large Scale.

During the last few years a somewhat remarkable development has taken place in agricultural tractors propelled by internal combustion motors, and seeking for the reason brings to light some interesting facts. It goes without saying that the wonderful work that has been done by motor car engineers has hastened the production of the practical farm motor by many years, and that the rapidly growing appreciation of the advantages of the internal combustion motor—its economy, efficiency, reliability and freedom from danger—has done as much to arouse the interest of the people most concerned. There is another factor, however, that has made the farmer's demand for a good tractor an imperative one. It seems impossible to supply the demand for horses where farming operations are carried out on a large scale, notwithstanding the fact that the last decade has witnessed an increase in the price of horseflesh amounting to nearly 150 per cent. Apparently nature is unable to keep up with the demand, and for this reason the large farmers are more than interested. They are insistent. It would seem, therefore, that nature's extremity affords rich opportunities for not only the automobile manufacturer but for the automobile dealers who look beyond tomorrow and who incline to fortify themselves accordingly.



HART-PARR TRACTOR PERFORMING DOUBLE DUTY

Steam, having been in the service of the farmer for many years, driving machinery of various kinds, naturally was first in the field and achieved some measure of success. The requirements of the steam engine, however, are such as to make it unsuitable for farm work, as compared with the less exacting explosion motor. Coal, the commonest fuel, must be transported to the machine, wherever it may be, and this necessitates the use of a special wagon, with its horses and driver; straw, often burned in the firebox, is suitable for the purpose only when the engine can be run at considerably less than its normal power. A moderate sized steam tractor will consume from 2,000 to 3,000 pounds of coal in an ordinary working day. Roughly speaking, each pound of coal will evaporate about a gallon of water, or from 2,000 to 3,000 gallons per day, all of which must be brought to the machine in a specially constructed tank wagon. This means another team and driver. There also is a tool wagon, which carries tools, spare parts, oil, packing and sundry odds and ends. By the time the expense of all this extra equipment is added to the cost of operating the engine—which usually requires three men at the least—there is an expenditure that makes it rather a matter for wonder that the showing of the steam tractor has been as good as it undeniably has.

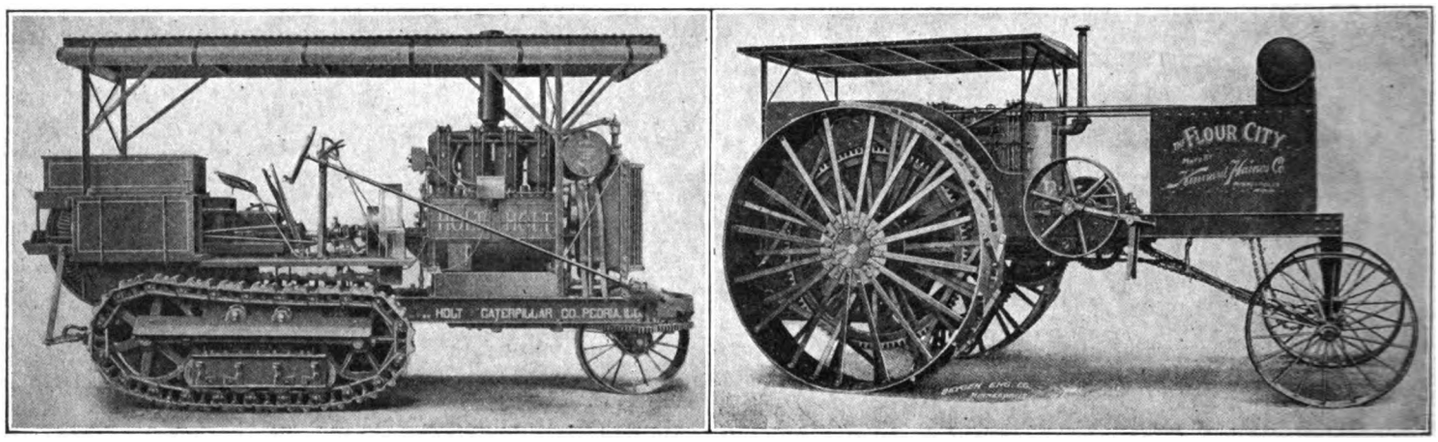
There is a third system for the application of power to tilling that is known as the cable system, in which a gang of plows is hauled to and fro on steel cables by a pair of engines located on opposite sides of the field. While this system has certain advantages of its own, and is capable of performing its work economically under certain conditions, it is suitable only for doing work on a very large scale, which is indicated by the fact that a complete cable plowing outfit costs from $25,000 to $30,000, while the steel cables alone, which last only half a year to a year and a half, cost from $600 to $900 each. This enormous expense at once puts the cable system in the class of things used by the very few, while the manufacturer of tractors does the bulk of his business with farmers who, though operating on a large scale, do not feel justified in making the huge outlay required for a cable system with its limited field of usefulness. Like the steam traction engine, the motor tractor can be applied to any one of a score of different uses requiring power, which is, of course, a matter of no small importance on a large farm.



PLOWING WITH RUMELY TRACTOR, "BIG BROTHER TO THE OX"

In considering the cost of ploughing with tractors as compared with the cost of doing similar work with horses, anything like exact figures is practically out of the question. The condition of the soil and the state of the weather both are dominant factors, and entirely capable of upsetting all calculations. Moreover, the cost of horses is

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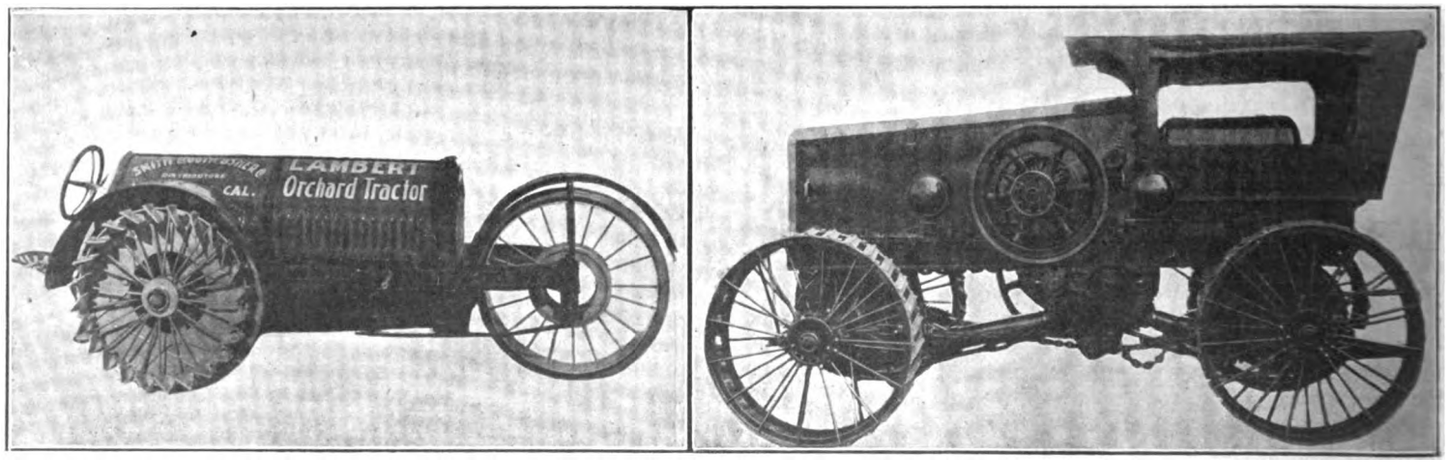
HOLT "CATERPILLAR," WHICH BUMPS ALONG ON ITS OWN TRACK, AND 40-HORSEPOWER "FLOUR CITY" TRACTOR

increasing; so is the cost of feed, the cost of lumber for stables, the cost of labor, and so on, while the cost of operating a motor tractor is becoming less year by year and the housing it requires is a mere frection of that needed by the horses, equipment, feed, etc., capable of doing the same work. But taking a rough average, which is the best that can be done under the circumstances, a good tractor will effect a saving of 25 per cent. over good horses doing the same work. While it cannot be said to enter into the financial part of the business to any great extent, there undoubtedly is a certain amount of importance in the fact that the men are relieved of the worry and anxiety incident to the care of living creatures, with their individual peculiarities and their liability to sickness and injury due to no fault of those who are in charge of them. As to the cost of fuel for operating a motor tractor under working conditions, a fairly good idea may be obtained from the results of the trials held at Winnipeg recently. Conditions were as nearly alike as possible for all machines. Twelve gasolene tractors did their plowing at an average cost for fuel only of 48.7 cents per acre; the highest cost per acre was 64.9 cents and the lowest 36.8 cents. Seven kerosene machines averaged almost the same—48.3 cents per acre; the highest was 59.9 cents and the lowest 33.7 cents per acre. It is rather curious, in this connection, that there is no appreciable difference in cost of fuel per acre between the kerosene and the gasolene machines. Of course, this matter of fuel expense is one that is governed entirely by local conditions. In some localities gasolene may be so expensive as compared with kerosene as to make its use prohibitive, while in other places the difference might be so slight as to be negligible, as evidently was the case at Winnipeg, and the advantages due to the greater volatility of gasolene would turn the scale in its favor. Kerosene is somewhat safer to handle, and for that reason it might be preferred under certain conditions, even if gasolene cost no more.

Motor tractors as a class differ from steam tractors in that they lack anything like uniformity of design and general arrangement, while practically all steam machines are more or less alike in their broader aspects. Steam engine practice is followed in some cases to the extent of employing a single cylinder motor for the sake of simplicity and cost reduction; while, on the other hand, there are four-cylinder motors of regular automobile construction, though naturally heavier than would be required for motor car or even truck work. Large cylinders and slow speeds are the rule. The M. Rumley Co., of La Porte, Ind., manufacturers of the Oil-pull tractor operating on kerosene, build their motors with one and two cylinders, the "twins" having cylinders side by side; bore and stroke are 10 inches and 12 inches, respectively, and the normal running speed 375 revolutions per minute, at which rate the output is 30 horsepower per cylinder. The Rumely motors all are of the horizontal type. The Hart-Parr Co., of Charles City, Iowa, builds only two cylinder motors, but in some cases these are horizontal and in other cases vertical.

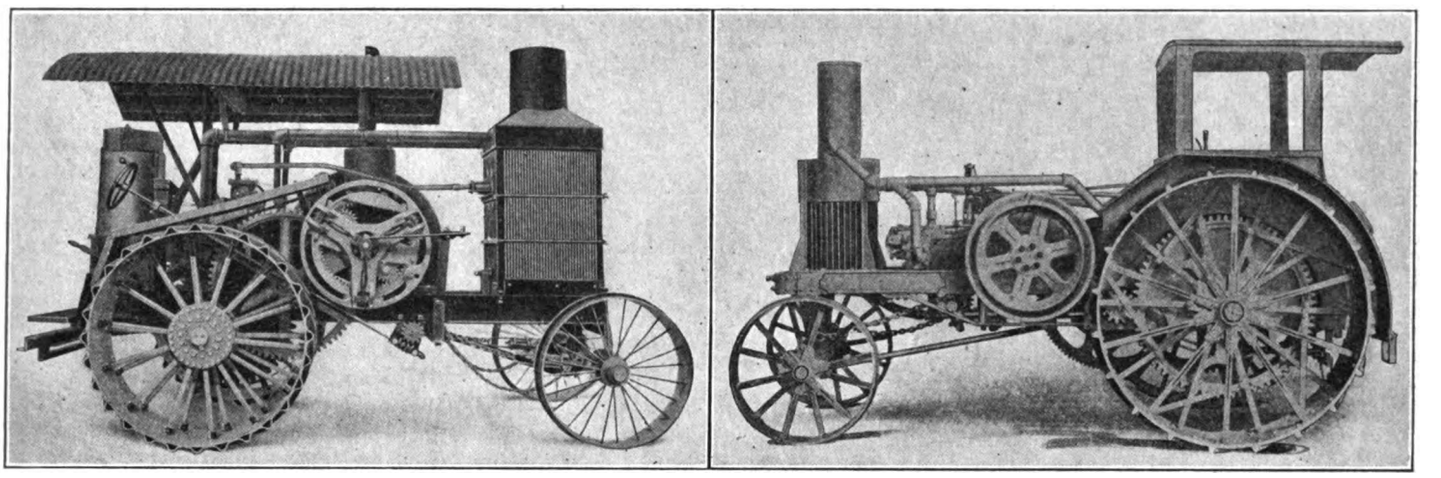
The motors built by the Avery Co., of Peoria, Ill., are of two types, differing about as widely as possible. One is a two-cylinder horizontal motor, with opposed cylinders, and the other a four-cylinder vertical motor, of regular automobile type.

These examples serve to give an idea of the diversity of opinion that exists in the matter of motor design, and it may be said that the same conditions are found more or less throughout the machines of the different makers. There is one point, however, on which there seems to be practically no divergence of opinion—the matter of cylinder dimensions and speed. From the big Hart-Parr, with bore and stroke of 10 inches and 15 inches, respectively, and its speed of 300 revolutions per minute, downward, there is the same tendency to build big, shafts and enormous bearings. In other words, the idea is to obtain constant ser-



TWO EXTREMES; THE LITTLE LAMBERT ORCHARD TRACTOR AND THE BIG HEER FOUR WHEEL DRIVE

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OIL COOLED HART-PARR AND WATER COOLED AVERY WITH BOX-LIKE RADIATORS AND EXHAUST STACKS

vice, under hard working conditions, with the least number of stops for adjustments and repairs. For the same reason there are as few small parts as possible, everything being large and strong and of simple design.

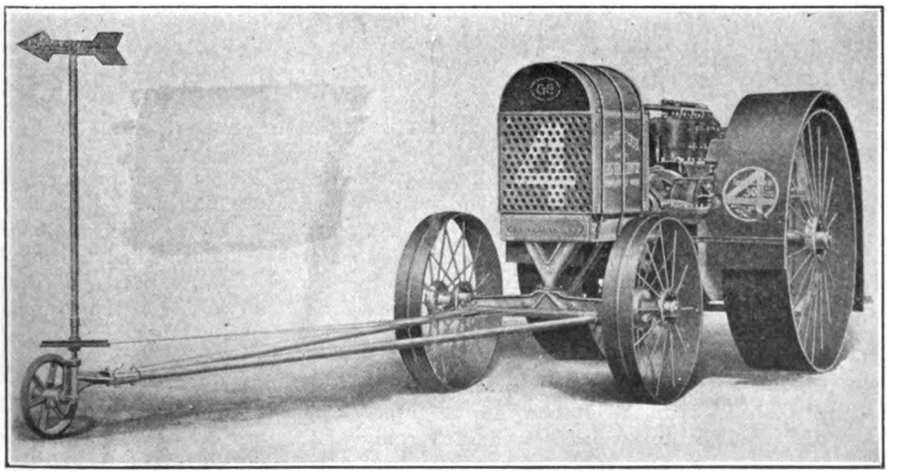
The rough ground over which agricultural tractors must work and the enormous tractive force they must exert at the same time, have of course given rise to features that are conspicuous and distinctive of the machines. There are some, however, which are conspicuous even in their own class, among which is the Holt caterpillar tractor, built by the Holt Caterpillar Co., of Peoria, Ill., which has no driving wheels, in the ordinary meaning of the term, but runs on an endless chain which forms a track for several steel rollers that carry the weight of the tractor. In effect, the rollers are the wheels, and the chain makes a smooth track upon which they run, regardless of the condition of the ground. Each chain runs over two sprockets, the two rear sprockets being mounted on a divided shaft driven through a differential.

Another departure from conventional design, and one which, like the well-named caterpillar, has as its object the securing of the traction that is so necessary in machines of this class, is that embodied in the Heer four-wheel drive tractor, manufactured by the Heer Engine Co., of Portsmouth, O. As the name implies, in the Heer tractor all the wheels are driving wheels, power being transmitted to them through chains from a change-speed gearing mounted between the front and rear axles. All four wheels also are steering wheels, but are not mounted on knuckles; the axles swivel from their centers, being connected to the hand-wheel gear through heavy chains.

Among the more conventionally designed tractors, employing rear-wheel drive and front wheel steering, the differences that exist, apart from engines and power transmission mechanism, are chiefly in the proportions of the parts, the locations of power plants and the housings af the mechanism. For instance, the "Big Four 30," built by the Gas Traction Co., of Minneapolis, Minn., and Winnipeg, Canada, is conspicuous for the enormous size of its driving wheels, which are no less than eight feet in diameter, with rims two feet wide. The four-cylinder vertical engine is located directly over the rear axle, which also carries the weight of the power transmission mechanism, leaving comparatively little weight for the front wheels which, for this reason, are of light construction, contrasting strongly with the great drivers. Another feature of the "Big Four" that is calculated to attract attention is an automatic steering device operated by a small guide wheel on the end of an outrigger extending ahead of the machine, the little wheel following the furrow last turned by the plow and so maintaining the alignment of the furrows without constant attention from the driver. Very large driving wheels are characteristic also of the Kinnard-Haines company's "Flour City" tractor, though the dimensions are not so extreme; the diameter is 6 feet and the rim width 16 inches. Both the "Big Four" and the "Flour City" tractors have their radiators mounted over the front wheels, where they are exposed to the air, and in the case of the latter there is an auxiliary water tank of cylindrical shape mounted on the top of the radiator.

Other tractors, of which the Avery, Hart-Parr and Rumely are notable examples, carry their machinery somewhat further forward of the driving wheels, and in each of these machines there is a distinctive type of radiator mounted over the front wheels, with a vertical stack or chimney that is just a little reminiscent of steam practice. The exhaust is piped to the chimney and, passing upward through it, induces an upward draught through the tubes of the vertical-tube box radiator, to which air is admitted from all sides. The cooling systems have this difference, however, that, while the Avery motor is water-cooled, the Rumely and the Hart-Parr machines have their cooling systems filled with oil which, among other advantages, will not freeze in winter.

Very different from these monsters of the wheat-field is the little orchard tractor built by the Buckeye Mfg. Co., of Anderson, Ind., and embodying the well-known Lambert friction drive. Apart from its comparatively insignificant general dimensions, this little machine is remarkable in that it is only only 42 inches in total height, the purpose of this low construction being to make the machine practicable for use in orchards, where the low-hanging branches of trees would preclude the employment of



"BIG FOUR" WITH "FEELER" OPERATING AUTOMATIC STEERING GEAR

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tractors of the ordinary type. The Lambert tractor, of course, has the wide range of speeds that goes with friction drive, and it is steered by a single front wheel; the driver sits low down in a seat which is carried on the extreme rear of the tractor, so that he is, to all intents and purposes, "following" his machine. The motor is a four-cylinder 40-horsepower machine of the Lambert automobile type. Owing to the comparatively light weight of the machine the power is ample for all purposes for which it is intended, and under ordinary conditions only a small part of the full power output is necessary.

A feature of the Lambert is the front tire arrangement. In the middle of the broad steel rim is a solid rubber tire which takes the weight on hard roads, while in soft ground the rubber sinks and the wide steel rim carries the load.

To Lessen Noise Made by Gears.

One of the causes of noise in gears which, while quiet in operation at first, suddenly develop sundry growls shortly after having been put into service, is said by a foreigner to be the practice, in vogue in some factories, of bringing gears back to true form, in cases where case-hardening has produced distortion, by "setting" in a heavy press designed for the purpose. This sets up internal strains—that is to say, it causes internal pressure, tending to bring the gear back to its distorted form—and sooner or later these strains, if sufficiently severe, will bring about sufficient twisting to cause noise. And it does not require many thousandths of an inch to do it. The only way to finish a gear, according to this writer, is to harden only the teeth and, after the teeth are finished, to machine all other parts so that they will be accurate with relation to the teeth. This eliminates press work and internal stresses.

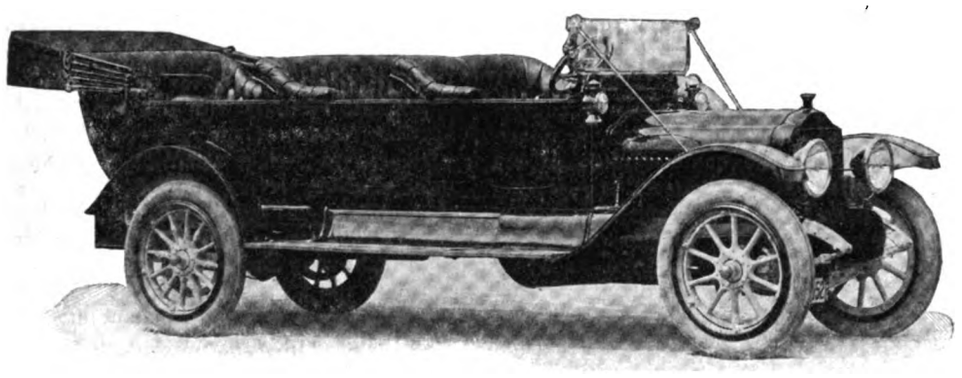
Batteries Blamed for Users' Neglect.

According to an experienced battery man, ignition storage batteries very frequently are condemned because their owners use them until the plates are sulphated and possibly seriously injured. The first sign of weakness should be the signal for re-charging.

THE SCIENCE OF TOP SUPPORTING

With Particular Reference to a Mammoth Top on a Mammoth Car—Devices That Are Used.

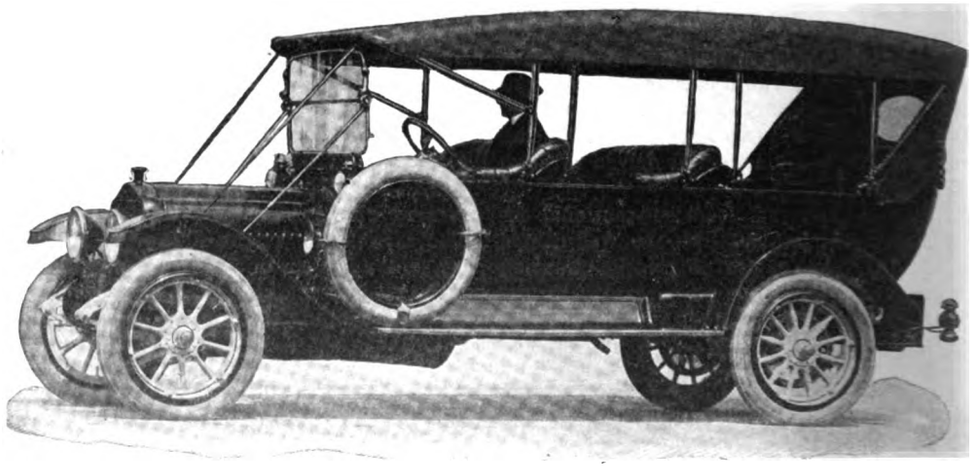
Of the many more or less minor things which may make or mar a car's appearance, it is doubtful if there is any which exerts a greater influence for good or for evil than the top. The top should "sit" right, in the first place, when it is raised, which necessitates, of course, that it be well and properly constructed. It is needless to point out that if it is too high it will give the car an appearance of top-heaviness, to say nothing of the effect of windage. And if it is too low, on the other hand, though a "chic" appearance is gained, it is gained at the expense of the comfort of those who ride in the car, because they are compelled to bend nearly double when getting in or out. The third consideration is that it should fold neatly and compactly when lowered, for there are few whose esthetic feelings are not shocked by a bulky, badly folded top which bags and gapes and collects dust and flaps in the breeze. As a matter of fact, it is this third consideration which in the majority of cases causes top manufacturers the greatest amount of trouble, for though it is a comparatively simple matter to build a top which will "fit" well when raised, it is less easy to secure a good fit when the top is lowered.



COLOSSAL TOP, LOWERED, SHOWING NEATNESS OF ITS FOLDS

The size of the car to which the top is fitted quite naturally has considerable to do with the ultimate solution of the problem, and though it might seem that the larger the car, and, consequently, the larger the top, the greater will be the difficulty, the rule does not obtain in every case, as may be judged by the accompanying illustrations, which show an unusually neat top which has been fitted by the Auto Specialties Mfg. Co., of Chicago, Ill., to a 10-passenger White car which was designed for special service. The top, it may be seen, is really colossal—it is said to be the largest folding top ever built—and when raised is just 12 feet 8 inches long.

Despite the size of the hood, however, its manipulation is comparatively simple and its appearance in either the raised or lowered position leaves little to be desired. Eight bows suffice to hold the top securely in place, and these eight bows are supported in but five sockets, this construction being made possible by the use of Bair bow hinges, which but recently have been developed, though they are in use at a number of factories, and which permit two bows to be hinged at an angle of 75 degrees and supported in a single socket. The top when folded back shows but five bow sockets and occupies scarcely more space than is occupied by the top on the ordinary seven-passenger touring car. When lowered the top is held by Bair holders, these as well as the hinges being products of the Auto Specialties company.



TOP IN RAISED POSITION SHOWING EIGHT BOWS WHICH HOLD IT

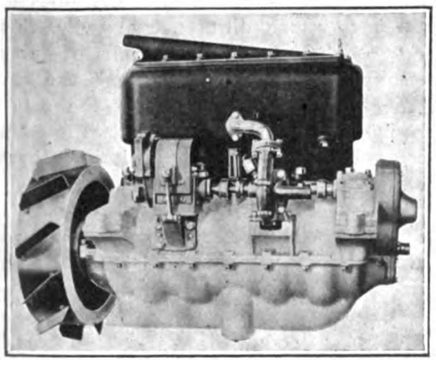
As regards the car to which the huge top is fitted, it has a flush-sided touring body of the closed front variety and provides seats facing forward for ten passengers. The rear compartment accommodates five passengers, two of whom are carried on auxiliary seats in front of the wide rear seat. The next forward compartment accommodates three passengers seated abreast and two more are provided for in the driver's compartment.

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SIMPLICITY MARKS STEWART TRUCK

Unit Construction Which Results in Unusual Accessibility Also a Feature—Long Stroke Motor Employed.

As great as is the field for the light commercial vehicle of, say, 1,000 to 1,500 pounds capacity, is it an undeniable fact that the construction of such vehicles requires just as careful study and as thoughtful design as does the construction of the heavier types of vehicles, for, broadly, efficiency means virtually simplicity and accessibility coupled with low up-keep cost. Low up-keep cost, it scarcely is necessary to point out, largely is a factor of design. Just as poor design causes excessive maintenance costs so does the efficiency of the vehicle become impaired, and it is apparent that if the efficiency of motor equipment, with its higher initial cost, is to compare favorably with horse equipment, the former must be chosen with due degard to its design and the suitability of the vehicles for the work which must be performed.



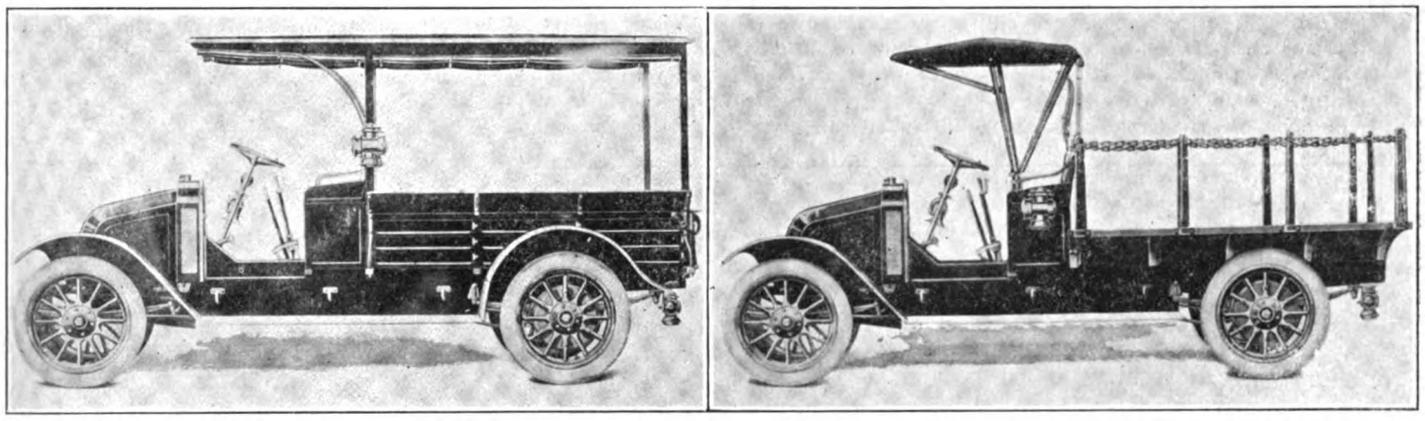
STEWART MOTOR—MAGNETO SIDE

With regard to simplicity, and, it follows, accessibility, it is doubtful if there is any vehicle of the same general type which more strikingly exhibits these two characteristics than the Stewart delivery wagon which but recently has been placed on the market by the Stewart Motor Corporation of Buffalo, N. Y. And as the vehicle represents the ripened fruit of the labors of T. R. Lippard and R. G. Stewart, both of whom were intimately connected with the Lippard-Stewart Motor Car Co. and previously with the H. H. Franklin Mfg. Co., there can be little doubt of the suitability of the car for the work formerly undertaken by horse vehicles. In the new Stewart Motor Corporation, which is quite separate and distinct from the company with which Stewart and Lippard formerly were connected, these two men occupy the positions of vice-president and chief engineer and president, respectively, and thus are in positions actively to supervise production, which accounts for the excellent features of the first product of the new company and ensures a continuance of the high standard of merit which has been set by the manufacturer.

By way of simplifying production methods, which, in turn, may be expected to simplify the cars themselves, but a single chassis is built, though upon it may be mounted a variety of body styles ranging from an open express type to a fully enclosed and paneled delivery wagon such as would be suitable for the transportation of perishable merchandise. The prices of the various bodies range from $150 to $550, depending upon their size and the elaborateness of their construction; the price of the chassis, however, is the same for all, the figure being $1,650.

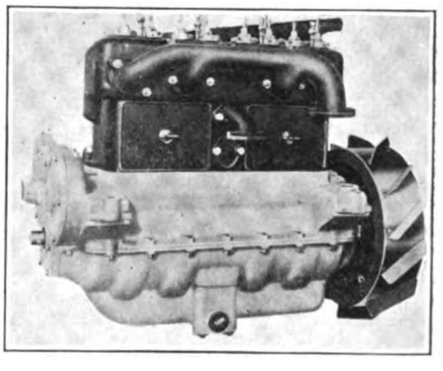
No less than simplicity has accessibility been made a fetish in the construction of the vehicle. Each component part has had practically all of its complexity removed and, in addition, each forms a separate unit which may be removed without the necessity for removing, or even disturbing, the other parts. As may be seen by the accompanying illustrations, the motor is minus many of the extraneous outside parts which form a more or less conspicuous portion of other motors in general. The single block casting which comprises the four cylinders is singularly clear of protruberances, the effect being heightened by the enclosure of the valve mechanism. The valves themselves are located all on the same side of the engine, which position conduces to simplicity in that it obviates the necessity for more than one camshaft.

By adopting long stroke practice—the engine is a Continental—the dimensions of the cylinders being 3¾ inches bore and 5¼ inches stroke, power in excess of the nominal rating easily is obtained and high torque at low rotative speed ensured. The nominal horsepower rating of the motor is 30, and even if this was not exceeded, ample power still would be available considering the load capacity of the vehicle, which is 1,500 pounds. More than ordinarily liberal bearing surfaces are provided, as becomes a motor which is intended for hard, continuous service, and the whole design is as rugged as is consistent with comparatively light weight



NEWLY PERFECTED STEWART LIGHT DELIVERY WAGON SHOWING TWO OF THE VARIOUS BODY STYLES

Permitting the elimination of all batteries and coils and a considerable amount of wiring, ignition is effected by means of a high tension magneto with fixed sparking point, no provision for varying the spark timing being made. Lubrication is by means of a combination force feed constant level system, the construction of which is peculiar to and characteristic of all Continental engines. One of the plunger pumps which forms part of the system forces the oil directly to the main engine bearings and the other pumps oil over the timing gear train which is contined in the crankcase. One of the excellent features of the lubrication system in general, as applied to the whole chassis, is that all moving parts are fitted with large grease cups, which are



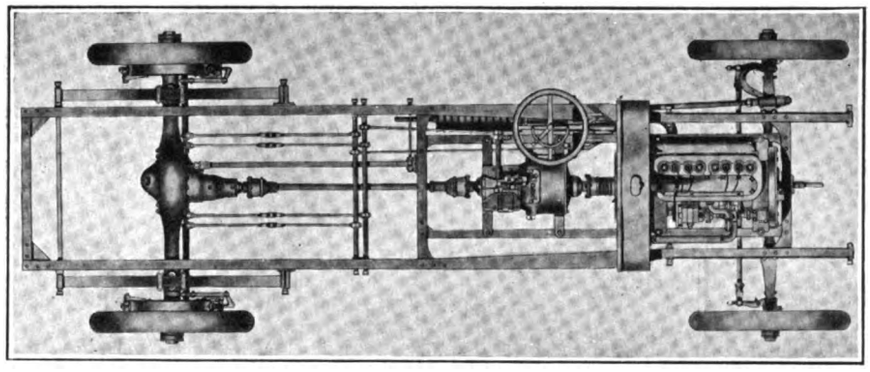
STEWART MOTOR—VALVE SIDE

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located outside the chassis frame, where they are instantly accessible.

Cooling is by water, circulation being ensured by means of a large size centrifugal, which is driven in the orthodox manner from the magneto shaft. All of the pipes are liberal in size, to preclude the possibility of overheating, and the radiator is spring mounted on the chassis to prevent damage from frame weaving or road vibration. The fan has been eliminated, its place being taken by radial fins which are riveted to the flywheel.

The change gear mechanism and the clutch, the latter being of the multiple disc type in which the plates operate dry, form a separate unit which is readily removable for adjustment or repair. The clutch is generous in size, its 11 plates, five of which are Raybestos faced, being 9 inches in diameter. Between the clutch and the gearset a Spicer universal joint permits of the necessary flexibility and at the same time provides a simple and quick



STEWART CHASSIS SHOWING SIMPLICITY AND ACCESSIBILITY OF PARTS

method of dissembling either by the removal of a couple of pins. The change gear mechanism is of Brown-Lipe construction and provides three speeds forward and reverse, control being selective by means of the usual side hand lever. Adjustable Timken roller bearings throughout are a feature of the gearset. Both front and rear axles are of Timken construction, the latter being of the full-floating type.

In working out the spring suspension of the vehicle the manufacturers have been at great pains to evolve an arrangement which should permit the proper degree of resiliency both when the car is loaded and when it is operated light. To this end, semi-elliptic front members and three-quarter rear members are used, the front springs being 38 inches in length and 2 inches in width and the rear springs being 50 inches in length and 2¼ inches in width. All spring shackles are provided with grease cups, the capacity of which makes refilling necessary only at long intervals.

By way of providing security in operation, two sets of brakes are fitted, both of them being on rear wheel drums of large size. The emergency set is internal expanding and is operated by means of a hand lever, and the service set is external contracting and operated by means of the usual pedal. The diameter of the brake drums is 17 inches. The wheelbase of the chassis is 126 inches and the wheels are shod with 34 x 4 front and 34 x 4½ rear pneumatic tires.

Characteristics of Oil-Mixed Concrete.

By way of rendering concrete moisture proof and non-absorbent, and at the same time retaining all of its inherent good qualities, the practice of mixing heavy residual mineral oils with the ordinary ingredients recently has been developed. "Oil-mixed" concrete is slightly more flexible than the ordinary concrete and will stand more deflection without cracking or chipping, and at the same time it is absolutely impervious to water, even when the water is under considerable "head." Oil to the amount of 10 per cent. of the weight of the cement which enters into the mixture is added after the other ingredients have been thoroughly mixed with the requisite amount of water. The oil entirely disappears in the mixture and does not separate from the other ingredients while the concrete is drying or after it has set. The reason the oil does not separate from the water is that the presence of the cement causes these two ingredients to form an emulsion. The time taken for oil mixed concrete to set, however, is about half as long again as the time taken by ordinary concrete. Owing to its flexibility and non-absorbent qualities, "oil-mixed" concrete would seem to offer possibilities for garage floor construction.

Clicks that Foretell Broken Balls.

If it is suspected that a wheel bearing harbors a broken ball it is a simple matter to allay the suspicion or to make certain of the diagnosis by jacking up the wheel and spinning it. If a sharp click is heard at intervals it is practically proof positive that a broken ball or balls exist. Needless to say, when such is the case it will not be sufficient to renew only the broken ball or balls, as the case may be. The other balls will have sustained a certain amount of wear and consequently will be slightly smaller than any new one which might be put in. It follows that the new balls, being larger, will support considerably more load than that for which they were intended and cannot be expected to survive for any great length of time.

Automobile Top as an Emergency Tent.

Not that the idea is absolutely brand new, but the action of a New Zealand motorist who recently was caught far from home with a "dead" engine and who removed the top from his car and utilized it as a temporary shelter, with the cushions of his car for a mattress, may serve to refresh the memories of those who contemplate long tours where hotel accommodations may or may not be available that such things are quite possible. Generally it is a simple matter to "unship" the top of a car and with a couple of stakes and a few pieces of heavy twine for guy ropes a fairly serviceable tent can be constructed. The side curtains, of course, will serve to complete the temporary abode, and one of the side lamps will lend at least a touch of the comforts of home.

Washing that Retains Lustre of Body.

N. J. Gourley, of Glens Falls, N. Y., is the owner of a Ford touring car which is said to be the remark of all who see it. Although used for four seasons, the body looks as fresh and new as the day it was purchased, a fact which has caused inquiry for Gourley's "secret." The "secret" is simple. Gourley simply removes all surface dust and dirt by the use of a hose, regulating the force to a slight pressure of the water. After the dirt is removed, the body is sponged off with a pail of water in which has been dissolved a handful of good linseed oil soap, after which the house is again turned on and the water permitted to dry by evaporation.

Peculiar Failing of Garage Workmen.

For some reason, which really does not make very much difference anyway, there is a decided tendency on the part of garage employes to neglect or "skimp" the back of the front seat when giving the car its cleaning and polishing. In a garage where there is not too much light it is rather a hard place to see, perhaps, but once the car is out of doors there is not a place on the whole machine that is more readily or more steadfastly observed by the passengers. And the appearance of the varnish is not perceptibly improved by streaks of dust or of brass polish, greasy finger marks and the like.

Depth Gauge of Simple Construction.

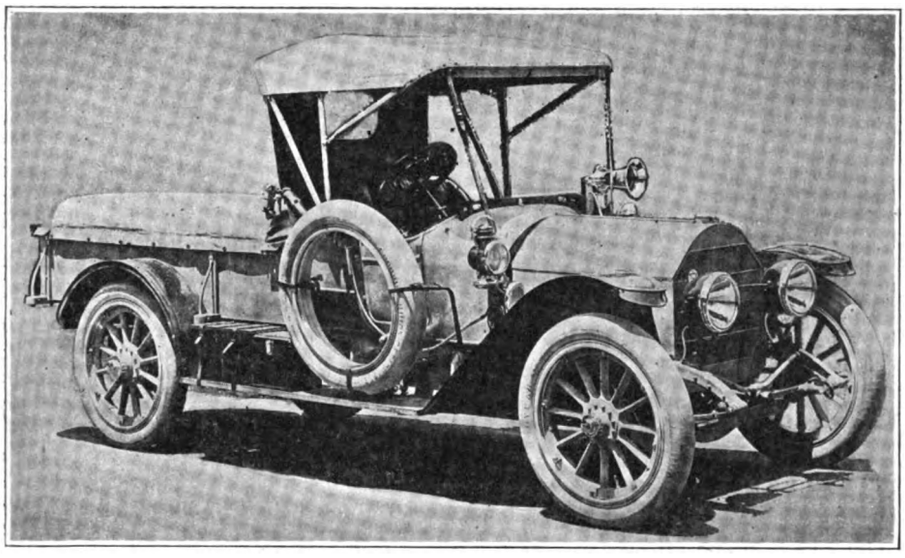
It sometimes is important that the depth of a hole or of a series of holes being drilled should not exceed a predetermined limit. When a depth gauge is not at hand, a piece of pipe or tube which will just pass over the drill and which is cut to proper length so as to expose only enough of the point of the drill to reach the required depth when the pipe is flush against the jaws of the chuck, makes a very effective substitute.

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TOURING CAR WITH CAMP COMFORTS

How a Kissel Was Converted Into a Home on Wheels—Few Changes That Were Necessary.

As a means for adding speed to the flight of time during the summer vacation time the motor car is almost in a class by itself; but occasionally one is evolved that is pre-eminent, even among motor cars, as a means of giving pleasure to lovers of outdoor life who desire to be entirely independent of hotels as well as of railroads. Such a machine is the Kissel car shown in the accompanying illustration; it is the property of a feminine motorist, Mrs. A. J. Payson, of San Mateo, California, and while it does not quite come under the description of a home on wheels, it is literally true that it carries an abiding place in the big box in the rear—and it also carries a surprisingly complete assortment of the requisite "household goods."



KISSEL CAMP WAGON THAT DOES DUTY IN CALIFORNIA

Starting with a Kissel car of the semi-touring model as a basis, a special addition was built back of the seat in the form of a steel box nine feet long and four feet wide, divided into compartments. In this big "bin" there is storage space for a tent, complete with poles and even the flooring that adds so much to the comfort of tenting; there are compartments for camp cots, stools, plenty of provisions, fishing and hunting gear, prospecting apparatus, and last, but not least, clothing. The top of the storage space is, of course, covered with waterproof material, and is rounded to shed rain.

The forward part of the car is of standard style, with top, windshield and side curtains for enclosing the seat in inclement weather, and the equipment, which is the Kissel car standard outfit, is complete even to the point of luxuriousness. An extra tire is carried inflated and ready for immediate use, on a demountable rim on the running board.

Warner Sells his Timing Apparatus.

Presumably to increase the revenue derived from the starting of races by increasing the number of races at which they will officiate, Fred J. Wagner, who has started most of the "big" affairs which have been run for years past and who will start not a few of those which are yet to come, and F. E. Edwards, erstwhile chairman of the Technical Committee of the Contest Board of the A. A. A., have jointly acquired control of the two Warner electric timing instruments which heretofore have been controlled by Mr. Warner himself. Although no definite information as to the plans formulated for the disposition of the instruments so that they will at all times be "handy" for those who are interested in race promotion have as yet been announced, it is not at all unlikely that one of the instruments will be under the control of Wagner in the East and Middle West, while Edwards will look after the other at points more remote from the Atlantic.

For the Promotion of Red Headedness.

The Emil Grossman Co., makers of the Red Head spark plug, has set aside $1,200 as an incentive to the use of their plug by the competitors in the Vanderbilt Cup and Grand Prize races, which will constitute Milwaukee's red letter program. Five hundred dollars each will be awarded the winners of the Vanderbilt Cup and the Grand Prize, provided their engines are Red Headed, while $100 each will be awarded under similar conditions to the winners of the two minor events, those for the Pabst trophy and the Wisconsin trophy.

The exact point at which a valve tappet leaves the valve stem is easily ascertained by putting a piece of thin paper between the two before they come together and pulling gently on it as the tappet descends.

IGNORANCE THAT IS BENEFICIAL

Wherein Certain Magneto Intricacies Are Not Explained—The Reasons Therefor Made Plain by an Expert.

"Well, yes, I will show you that piece of mechanism very gladly," remarked the advertising manager of one of the largest magneto manufactories in the country or in the world, for that matter, "but I must insist that it is to be used for your own information solely and not for publication."

"Why the condition?" inquired the inquisitor. "Am I overstepping the bounds of propriety and 'nosing'?"

"No, it's not exactly that. Of course, we have our trade secrets, as they are called—little points of design and little methods of procedure, which we believe are foreign to other magneto manufacturers, and which naturally are kept behind sealed doors. Our real 'secrets,' however, are carried in the heads of those few geniuses who compose the engineering staff. They have to do with the designing and the endless computations which are so necessary to determine the correct carrying capacity of this length of wire, the limit of magnetic saturation of that piece of steel, the capacity and capacity variations of condensers and connections and an infinite number of similarly complex mathematical deductions. It is owing to the care with which these computations have been carried out and the new things which have been determined by means of the symbols, that our magneto will produce a nearly uniform spark throughout under all conditions.

"To preserve these secrets, however, is not the object I have in view when I imposed the condition. Honestly, I fully believe that our secrets will take care of themselves, so to speak. No, we have determined, after years of experimenting, that the less we tell a user about the working parts of our product, the more durable does the product prove."

"Just so long as we direct the whole of the attention of the average motorist toward supplying the proper quantity of the proper quality oil to the proper magneto bearings at the proper intervals, just so long do we experience the minimum of trouble. When, however, we begin to tell the owner just how many wires are on the armature and how they are disposed, and how many square feet of tinfoil are used in the condenser, his interest becomes aroused, and the first thing you know out comes a screwdriver and a monkey wrench, if such delicate instruments are near to hand, or a crowbar and sledge hammer if they happen to be the nearer, and presently the whole 'inners' of the magneto are exposed to the eye of the owner, who is industriously counting the layers of wire to see if the manufacturer hasn't overestimated. No, sir, it does not pay to arouse curiosity."

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NO FOREIGNERS FOR ELGIN RACES

French Team Never Intended to Compete —List Closes With 35 Entries—Few of Them in Minor Events.

While the difficulties which beset the promotion of the Elgin speed carnival, which will start tomorrow, August 30, and be concluded on the following day, Saturday, August 31, made evident that attracting a fitting list of entries would be no easy task, the Chicago Automobile Club, which, at the eleventh hour, took over the burden, has gotten together a list that, everything considered, is a credit to all concerned. When the entries closed Saturday last, 35 cars had been entered.

To the list of the well-knowns, including Bruce-Brown (Fiat), Mulford (Knox), Hughes (Mercer), Tetzlaff (Fiat), Clark (Mercedes) and Bergdoll(Benz), who early announced their intentions of competing in the free-for-all event, has been added the names of Ralph De Palma, who will pilot a Mercedes, as usual; Neil Whalen, who will handle the wheel of the National entry, and Caleb Bragg, who has not named his mount. Louis Bergdoll, however, will not compete for the Elgin National trophy, but the list of those who will start in the event has been augmented by the names of Gil Anderson (Stutz), Len Zengle (Stutz), Spencer Wishart (Mercer), Harry Hastings (Fal), Trussell (Fal), and F. S. Dusenberg (Mason Special).

Rumors, which have been flitting about for the past few weeks that the Elgin folk will witness the first appearance of George Boillet, who won the French Grand Prix, and his team mate, Jule Goux, have come to naught. The two Peugeot cars, which are on their way to America, have not arrived, which, it is stated at the New York agency, is not disappointing, since the cars are being brought over for use in the Vanderbilt and Grand Prize races only.

Practice over the course began even so early as a week ago last Monday, though at the time the finishing touches had not as yet been put on the "manicuring" operations. Monday last, however, saw the over eight and one-half miles of road in prime condition; the slow-moving road tractors and rollers were removed, and not a few of those who will be competitors in the coming contests began daily work. That the road is fast and calculated to be productive of interesting contests may be gleaned from the fact that on the second day of regular practice Tetzlaff, timed by expert "railbirds," circled the course in 6:55:23.1, driving the Fiat, which is 17.77 seconds better than the record set up by Len Zenzle (National), the winner of last year's Elgin trophy.

For the Illinois trophy, which will be contested for on the first day of the meet, and which will go for 203 miles, four contenders are listed—Gil Anderson (Stutz), Len Zengle (Stutz), Neil Whalen (National) and W. Hobbs (Rayfield).

Trussell and Hastings will drive the Fal entries in the 153-mile event in competition for the Aurora trophy; they will be opposed by three Mercers, with Hughes, Pullam and Wishart up, and a Mason to be driven by M. Roberts. The "baby" car event—for cars under 261 cubic inches—boasts of but three entries—Harry Endicott (Mason), W. G. Wordingham (Herreshoff) and Moe (Ford). As the lists stood when the entries closed on Saturday last, 24th inst., the following were entered:

Free-for-all, 306 miles.

David Bruce-Brown	Fiat
Theodore Tetzlaff	Fiat
Louis Bergdoll	Benz
George Clark	Mercedes
Hughie Hughes	Mercer
Ralph Mulford	Knox
Neil Whalen	National
Ralph De Palma	Mercedes
Caleb Bragg	———

Elgin Trophy, 254 miles.

Theodore Tetzlaff	Fiat
Len Zengle	Stutz
F. S. Dusenberg	Mason Special
Gil Anderson	Stutz
George Clark	Mercedes
Hughie Hughes	Mercer
Spencer Wishart	Mercer
Neil Whalen	National
Ralph Mulford	Knox
Ralph De Palma	Mercedes
Harry Hastings	Fal
——— Trussell	Fal
David Bruce-Brown	Fiat

Illinois Trophy, 203 miles.

Len Zengle	Stutz
Gil Anderson	Stutz
Neil Whalen	National
W. Hobbs	Rayfield

Aurora Trophy, 153 miles.

——— Trussell	Fal
Harry Hastings	Fal
Hughie Hughes	Mercer
E. Pullam	Mercer
Spencer Wishart	Mercer
Mortimer Roberts	Mason

Under 261 Inches, 96 miles.

Harry Endicott	Mason
W. G. Wordingham	Herreshoff
F. W. Moe	Ford

Electric Completes A. A. A. Pathfinding.

After a remarkable and strenuous journey, the Flanders electric coupe, in charge of W. O. Westgard, the A. A. A. pathfinder, yesterday, 28th inst., completed its task of blazing the route of the National Reliability Tour from Detroit to New Orleans. It entered the Crescent City with a numerous escort of motorists representing the New Orleans Automobile Club, and received a cordial welcome. The party left Detroit on Wednesday, July 31st, and therefore required 29 days to complete the approximately 1,100 miles of travel, an average of 37.8 miles a day. So far as is known, it is the longest and by far the hardest straightaway journey ever completed by an electric vehicle.

WISHART TAKES DOUBLE CENTURY

New Yorker Leads Most of the Way and Sets up Two Records—Mishap Robs Raimey of Glory.

If no hitch develops in the checking up of the time sheets, the present indications are that hitches will be conspicuous by their absence, Spencer Wishart, who piloted the Mercer entry in the 200-mile track race at Columbus, Ohio, will have to his credit two records for intermediate distances. Wishart completed the race in 3:28:4½, leading home the four survivors of the nine other contenders who started. The records he created were for 75 miles, which he covered in 1:19:38, against 1:19:39 made by Strang (Buick) in 1909 on the same track, and for the century, his time being 1:40:51, as against 1:41:00.4 made over the same course by Burman (Buick) in 1909.

Of the ten who started in the double century several are no strangers to fame—Neil Whalen (National), John Jenkins (Cino), Howard Wilcox (Cino), Spencer Wishart (Mercer), John Raimey (Ohio) and Harry Knight (Knight Special), who carried off the honors last year. The lesser lights were Harry Mathiews (Ohio), Marion Trexler (Stoddard), Charles Elliot (Firestone - Columbus), and Ben Lawell (Westcott).

John Raimey, who piloted the Ohio entry, early assumed the lead and looked like a sure winner until a broken connecting rod retired him during the 15th lap. Whalen (National) then forged ahead, only to be displaced after holding the lead for two rounds by Harry Knight, who drove a reconstructed racing car entered as a Knight Special. He stayed there until passed by John Jenkins (Cino) on the 24th lap, and Jenkins, in turn, remained in front until Wishart assumed command after 65 miles had been completed. Wishart was not again headed, and finished over seven minutes in front of Wilcox (Cino). Third place went to Jenkins (Cino) and fourth to Neil Whalen, who piloted a National, as usual.

From the standpoint of weather conditions and lack of accidents the race was ideal; excessive tire trouble, however, played hob and caused several of the withdrawals, and not a little motor trouble also was experienced. The greatest excitement was created when Marion Trexler's Stoddard caught fire, due to the combination of a short-circuited ignition system and a leaky carburetter. The flames, however, very quickly were extinguished. The summary:

200 miles, for cars with displacements of under 601 inches—Won by Spencer Wishart (Mercer), time, 3:38:04.5; second, Howard Wilcox (Ohio), time, 3:35:10; third, John Jenkins (Cino), time, 3:35:30; fourth, Neil Whalen (National), time, 3:36:39.

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PASSENGER'S NEGLIGENCE AN ISSUE

But Court Holds That Conversation With Fellow-Guest Does Not Entail Culpability—Jury Verdict Sustained.

Guests have brought down on their hosts no end of trouble, much of which has led to law, but in the opinion of the Appellate Division of the New York Supreme Court, Second Division, if an automobilist's guest meets death at a railroad crossing while in conversation with a fellow guest such conversation of itself does not constitute contributory negligence, nor free the railroad company from responsibility. This ruling just has been handed down by the court in question on an appeal of the Long Island Railroad Co. from a decision awarding $45,000 to Sarah Terwilliger, as administratrix of William Terwilliger, her husband, who was killed at a Long Island Railroad crossing on October 3, 1909. The decision of the higher court sustains the jury's findings. It was written by Justice Woodward and concurred in by his four associates, Justices Hirschberg, Thomas, Carr and Rich.

"It appears from the evidence that Dr. Terwilliger, plaintiff's intestate, was invited to accompany a Mr. Welsh in his automobile to Long Beach on the day in question, and that Dr. Terwilliger and Mr. Welsh were accompanied by a Mr. Rhoades, who occupied the 'rumble' seat upon Mr. Welsh's roadster, and who was, at the time of the accident, leaning forward, talking to Dr. Terwilliger," says the court. "Mr. Welsh owned the car and was driving the same, and there is no suggestion that Dr. Terwilliger had any authority or control over it or its driver. He was merely a guest of Mr. Welsh, and there is nothing to overcome the presumption that Mr. Welsh was operating the car in a lawful manner and that he was a reasonably prudent man, competent to drive the car.

"There is nothing in the record to show that Dr. Terwilliger had any reason to suppose that Mr. Welsh was not a careful man, or that he had any reason to exercise any other degree of care than that which is incumbent upon all men, and that is that reasonable care which a reasonably prudent man should or would have exercised under the same circumstances. He was a passenger—a guest—in a car operated by a friend, and while he could not close his eyes to an obvious or well-known danger, he was not called upon to exercise any any active vigilance to guard against a danger which was not known to him or which was not likely to befall one situated as he was in this car. He had a right to assume that Mr. Welsh, his friend, would exercise reasonable care in the operation of this car, and unless he was aware of the railroad crossing and had reason to apprehend that Mr. Welsh would run his car into a position of danger, the jury might properly find that he was in the exercise of that reasonable degree of care which an ordinarily prudent man would exercise under like circumstances by merely sitting still in his seat and talking with a fellow-passenger. This is probably what 75 per cent. of the persons who go out for a drive with their friends do under the circumstances. They have no power over the car, no authority over the driver, and while they would not be free to ride with a reckless driver, knowing the fact, and charge their misfortunes upon others, we do not think it can be said that there is a failure to produce evidence of a lack of contributory negligence where it appears, as it does here, that the plaintiff's intestate was sitting in his seat engaged in a conversation with a fellow-passenger who was occupying the seat behind him, and who was leaning forward for the purpose of carrying on the conversation, leaving the driver free to manage the car.

"Of course, if the passenger was familiar with a known danger, if he was better informed of the circumstances than the driver, it might be his duty to watch and point out the danger, but here the car was being driven upon a flat land in broad daylight and at an angle with the railroad track, which had been crossed some distance back and which was to be crossed again at grade. It was an open country and, assuming that the plaintiff's intestate was familiar with the country—which is the most favorable view for the defendant—it cannot be said as a matter of law that he was bound to anticipate that Mr. Welsh would drive upon the crossing without observing the situation and taking the necessary precautions. If there had been nothing to divert his attention he might have been called upon to observe the situation in common with Mr. Welsh and to protest against taking any risks, but the evidence shows that he was engaged in talking with Mr. Rhoades, who was behind him, and he certainly was not called upon to be alert and active to see to it that Mr. Welsh did not drive upon a railroad track which was in his immediate view, in the face of an oncoming train. True, the jury might have held that this was not that reasonable degree of care which the circumstances demanded, but we cannot say, as a matter of law, that, taking the most favorable view of the evidence, the plaintiff's intestate was guilty of contributory negligence, nor can we say that there was not evidence in the facts and circumstances to justify a jury in saying that he was in the exercise of reasonable care. The negligence of Mr. Welsh —if it was negligence—is not to be imputed to plaintiff's intestate; the only question for the jury, assuming the negligence of the defendant, is whether the evidence shows the plaintiff's intestate to have been free from negligence contributing to the accident, and we think the circumstances disclosed justified the jury in finding in behalf of the plaintiff upon this question.

"This view of the case disposes practically of the principal objection urged upon this appeal, for if the evidence is sufficient to warrant a judgment in favor of the plaintiff upon the theory that the plaintiff's intestate knew the locality, then the admission of evidence tending to show that he did not know the locality, which the jury was subsequently directed to disregard, could not be of such a prejudicial character as to justify the reversal of a judgment, assuming the ruling to have been erroneous in the first instance. The evidence specially objected to was given by Mr. Rhoades. He was asked, 'Was anything said about going to Long Beach between you?' He answered, 'Yes, sir.' Mr. Welsh said: "Let us go down to Long Beach. I have never been down there before, and we might as well go down." Dr. Terwilliger and myself both said, "Yes, let's go down."' Objection was made to this as being inadmissible and hearsay, and after some discussion, in which it appears from the record that it was assumed that the witness had testified that Dr. Terwilliger had said that he had never been to Long Beach, although no such testimony had been given, the court announced that the answer would be retained in the record, and that defendant's counsel might ask for a proper direction to the jury. Counsel promised to make the request at the proper time, and then took an exception to the ruling. Subsequently the court distinctly called attention to this testimony and directed the jury to disregard it. It is to be remembered that this testimony was in the case without objection, and under such circumstances as it is not error for the court to refuse to strike it out; the remedy is by a request to the court to instruct the jury to disregard it (Marks v. King, 64 N. Y., 628; Cole v. Fall Brook Coal Co., 159 N. Y., 59, 65).

"It is also urged that the court erred in permitting Mrs. Wilson to testify that she saw the accident and that she exclaimed, just at the moment of the approaching collision, 'Why don't they blow that whistle, the people in that car don't see that train.' The court subsequently struck out the declaration 'the people in that car don't see that train,' and permitted the remainder of the exclamation to remain, the defendant taking an exception. The issue to be determined was whether the defendant had given any warning on its approach to this crossing, and it was clearly competent for the plaintiff to prove that no whistle was blown, and this witness had testified that she heard no whistle, and the fact that she made an exclamation at the very crisis of the transaction, referring to the fact that no whistle was blown, seems to us to be competent; it was a fact which showed that her attention was directed to the very matter in issue."

As the deceased at the age of 35 was earning $5,000 per year, the court also refused to hold the award excessive.

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1,015,006. Automobile Spring Wheel. Max E. Crandall, Lawton, Okla. Filed Feb. 28, 1910. Serial No. 546,573.

A wheel of the character described, comprising an outer rim, an inner rim spaced from the outer rim, side plates connected to the outer rim and provided in their inner faces with radial grooves, spring holders connected to said outer rim and projecting inwardly therefrom, the said spring holders being formed with radially disposed inwardly projecting threaded stems, coiled compression springs secured at their outer ends around said stems and projecting radially therefrom, an abutment head connected to the inner end of each of said springs and bearing upon said inner rim, each of said abutment heads being provided with laterally projecting pins movably engaging in the radial grooves of the plates.

1,015,015. Shock Absorbing Device. Maximilian K. Golden, Detroit, Mich. Filed Aug. 25, 1910. Serial No. 578,898.

A shock absorber comprising a pair of disks, each disk having a marginal flange, the flange of one disk telescoping with the flange of the other disk and having direct peripheral engagement therewith, said disks being respectively connected with the body of a vehicle and its axle or spring, means for pivoting the disks together, means connected with the aforesaid means and engaging one of the disks to hold the disks yieldably together, the flange of one disk being slitted peripherally throughout a portion of its circumference to provide for frictional adjustment of said flange with relation to the flange of the other disk, and means for operating upon the slitted flange to expand or compress the latter and thereby regulate the frictional relation of said flanges, said flanges having coacting cam surfaces operative independently of said yieldable holding means.

1,015,036. Vehicle Tire. Benjamin F. Lare, Philadelphia, Pa. Filed Dec. 12, 1910. Serial No. 596,750.

In a tire, a plurality of convolutions of suitable material, bifurcated clips engaging said convolutions, an extension on each side of each end of said clips and clamping means adapted to engage said extensions to secure said convolutions to a wheel rim.

1,015,037. Vehicle Tire. Benjamin F. Lare, Philadelphia, Pa. Filed Dec. 16, 1910. Serial No. 597,631.

In a tire, a plurality of convolutions of suitable material, each convolution being depressed at the outer portion thereof to form a seat, the ends of each convolution passing each other and extending toward the rim on each side of said seat, and a tread member held in said seat.

1,015,038. Tire. Benjamin F. Lare, Philadelphia, Pa. Original application filed Sept. 30, 1910, Serial No. 584,658. Divided and this application filed Jan. 28, 1911. Serial No. 605,152.

A spring section for a tire consisting of a coil formed of a convolution of spring material, the ends of which terminate upon opposite sides of the tread whereby two abutting portions of the material form a continuous tread of the section, and said ends extending toward the rim and abutting the sides of the next adjacent sections.

1,015,049. Power Transmission Device. George W. Marble, Milwaukee, Wis. Filed Mar. 18, 1911. Serial No. 615,275.

In a power transmission device the combination of two confronting friction disks, two opposed friction wheels, between said disks, on opposite sides of the axis of rotation of said disks, a shaft for each of said wheels adapted to be readily moved in parallel paths, to and from said disks, and a self-adjusting equalizing means for moving said shafts and respective wheels into contact with the respective disks.

1,015,064. Vehicle Wheel. Samuel Oldham, Philadelphia, Pa. Filed June 28, 1910. Serial No. 569,312.

In a wheel, a disk having a centrally projecting hub-sleeve and an annular flange at the inner end of the latter formed with a circumferential series of seats, a disk having a central outwardly projecting neck fitted upon the sleeve and an inwardly projecting flange formed with a circumferential series of seats registering with and complementary to the first-recited seats, a nut threaded upon the sleeve to bear against the end of the neck to force and hold the flanges together, an annular wheel-portion the inner rim of which has lateral confinement and radial play in the annular space formed between the disks and is formed with a series of seats in its inner periphery, and a tubular resilient ring confined in the space between the disks, seat-flanges and inner wheel rim and formed with transverse lugs upon its inner and outer peripheries to fit into the seats.

1,015,089. Ignition System. James E. Seeley, Los Angeles, Cal., assignor to High Frequency Ignition Coil Company, Los Angeles, Cal., a Corporation of California. Filed Nov. 28, 1910. Serial No. 594,597.

In an ignition system, the combination of a source of electric current, a charging circuit connected thereto and including self-induction means, a plurality of discharge connections, a distributer for establishing connection successively from said charging circuit to said discharge connections, an interrupter connected in the charging circuit, a condenser connected to the charging circuit to receive a charge therefrom on interruption of said circuit, and to discharge through the discharge connections, means for controlling the time of operation of said interrupter and a supplementary connection for the charging circuit independent of the discharge connections through the distributer to enable energization of the charging circuit, precedent to the connection of the charging circuit to any given discharge connection by the distributer.

1,015,101. Explosion Engine. John G. Utz, Detroit, Mich., assignor to Chalmers-Detroit Motor Company, Detroit, Mich, a Corporation of Michigan. Filed Dec. 22, 1908. Serial No. 468,752.

In an explosion engine, the combination of a crank case forming a chamber, a cylinder, a piston therein, and a plurality of differentially moving ported sleeves surrounding said piston and controlling communication between said crank case and cylinder above the piston.

1,015,186. Vehicle Wheel. William H. Humfeld, Kansas City, Mo. Filed Feb. 6, 1911. Serial No. 606,740.

In a vehicle wheel, a felly plate, plates extending radially from the felly plate and having flanges bolted thereto, said plates being spaced to form a channel, a tread plate, guide members extending inwardly from the tread plate and having flanges secured thereto, said last named plates being spaced to form a channel into which the projecting members on the felly plate are extended, cups fixed to the tread plate, posts threaded into said cups, and springs surrounding said posts and cups and bearing against the felly plate and tread plate, the inner ends of said springs being projected through the felly plates into the wheel felly, substantially as set forth.

1,015,199. Spring Wheel. James Lowe, San Francisco, Cal., assignor of one-third to John Pellaxio, San Francisco, Cal. Filed May 29, 1911. Serial No. 629,965.

A spring wheel, comprising a hollow rim, a hollow hub, said rim and hub having annular walls in juxtaposition, pairs of radially alined hemispherical seats formed upon said walls, said seats being perforated, washers having sockets seatable upon said seats, expansible springs interposed between the opposed washers, limiting bars passing through said springs and through the perforations in said seats, apertured guard plates spanning the space between the rim and hub, and clamping members passing through said guard plates to thereby secure the plates to the rim and press the same against the hub.

1,015,272. Starting Device for Internal Combustion Engines. George L. Henry, New York, N. Y., assignor to The Henry Manufacturing Company, New York, N. Y., a Corporation of New York. Filed Oct. 3, 1911. Serial No. 652,539.

The combination with an engine consisting of a plurality of working cylinders having inlets through which a supply of hydrocarbon fuel is supplied to the same, an intake manifold communicating with said inlets, an ignition system for the engine, a tank for gas under pressure, a valve casing, gas carrying connections leading from said valve casing to said tank and to said manifold, a valve plug in said casing for controlling the flow of gas therethrough, electric contacts upon said casing connected with the ignition system, and a switch carried by said plug adapted to complete a circuit between said contacts during the time that gas flows through said valve casing.

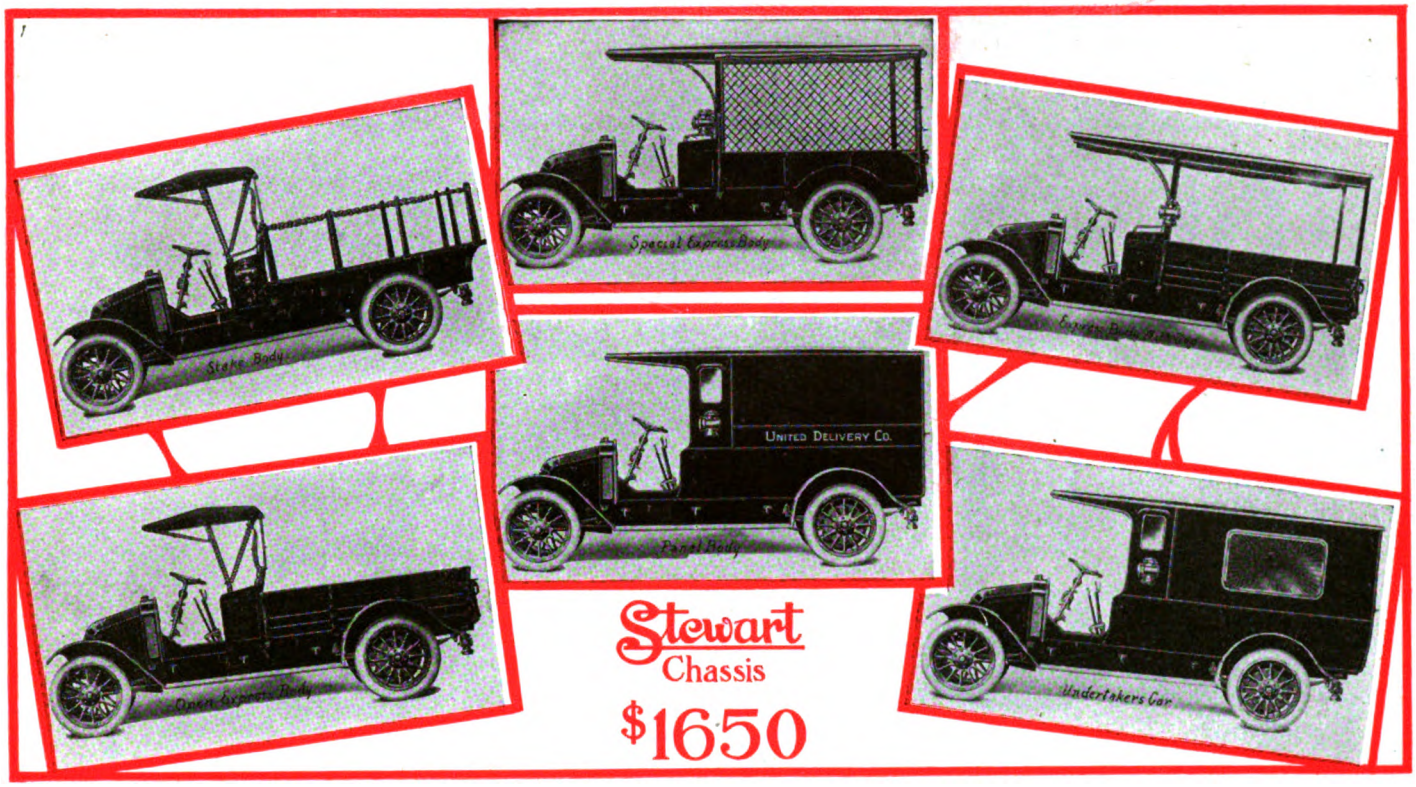
1,015,295. Steering Gear. George H. Chaplain, Leavenworth, Kan. Filed Feb. 2, 1911. Serial No. 606,271.

A steering gear including a quadrant having an elongated hub, independent shafts journaled in the ends of the hub, clutch-members carried upon the shafts for alternate interlocking engagement with the hub, holding means connected to the clutch-members for interlocking one of the same normally with the hub, and a lever connected to the clutches for alternating the interlocking of the clutches.

1,015,300. Automatic Lock Switch. Warren R. Cox, Cleveland, Ohio. Filed Aug. 4, 1910. Serial No. 575,451.

In devices as described, a suitable base and casing, an electrical switch adapted to be oscillated in said casing, a barrel having a flat sided extension operatively engaged with said switch and projecting through the same, a key removably engaged in said barrel and means engaging said barrel adapted to be liberated by the insertion of said key and release the barrel for operation, and means to lock said flat sided extension to said base.

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Five Reasons Why

Stewart Delivery Cars Are Money-Makers for Dealers

There are big money-making possibilities for dealers in handling Stewart Delivery cars. Thousands of merchants are already convinced of the value of motor delivery. They are now looking for the right car; one that is scientifically designed for delivery service. Read these five reasons. They will convince you that sales will be easy and profit sure.

1. No Seasons:

The dealer can sell Stewart delivery cars every month in the year. There are no seasons—no hold ups for new models to appear while your rent and expense pile up. Every month's sale should be an advance over the previous month. Your sales force can be kept busy every day.

2. No Trading:

Merchants buy delivery cars to use, not to look at. They are never out of style. So long as the car runs, the merchant will use it and the longer it runs the better he is pleased. Instead of having to take old cars in trade, every car you sell is a help toward selling additional ones to the same buyer.

3. Small Expenses:

Selling commercial cars, your operating expenses are only about half what they are in selling pleasure cars. Fancy salesrooms unnecessary; no joy riding; no expensive entertainment; no second-hand cars in storage running up your investment. Selling commercial cars is a business proposition, to be handled in a business-like way.

4. Easy Sales:

It is easy to find prospects for Stewart Delivery Cars. Every merchant using two or more horse-drawn vehicles is a prospect. Merchants are coming to realize the convenience and saving of motor delivery. It isn't a question of getting them to adopt motor delivery, but to show them the right car. We have it. If their competitor buys them, they must buy to keep up with the race.

5. Repeat Orders insure a steady and growing business:

The sale of one car to any merchant with several delivery vehicles is sure to lead to other sales.

The dealer who gets started now is going to get the cream of the business, besides laying the foundation for a permanent future business that will increase year after year.

Stewart delivery cars are made by a live and amply financed company, having facilities for turning out a large output. Every department head is a thoroughly experienced automobile man with years of experience in this business. They know what dealers want and how to assist them in securing business. Write for our literature and liberal proposition to live dealers.

Stewart Motor Corporation, Buffalo, N.Y.

T. R. LIPPARD, Pres. and Gen. Mgr. — R. G. STEWART, Vice-Pres. and Chief. Engr.
R. P. LENTZ, Sec. and Treas. — ROBT. W. INGERSOLL, Sales Mgr.

Separate from and having no connection with the Lippard-Stewart Motor Car Company

Features Which Make the Stewart an Ideal Delivery Car

Continental Motor

Long stroke, 30 h.p., 3¼" bore x 5¼" stroke, three-bearing crank shaft, cylinders en bloc. Centrifugal water pump, force feed constant level lubrication.

Brown & Lipe Transmission

Selective sliding gear type, recognized everywhere as standard.

Timken Axles front and rear

Timken roller bearings are used throughout running gear and transmission, everywhere but in the motor.

Multiple Disc Clutch

Dry plate type, with 5 Raybestos and 6 steel plates.

Big Tires

34" x 4" front, 35" x 4½" rear.

Wheel Base

126 inches.

Bodies of new design

Larger than usual, 7-ft. loading space.

Radiator at Dash

Out of harm's way—the popular construction abroad.

Complications Eliminated

Single ignition (magneto). No spark lever, no batteries, timer, coil, etc. No belt-driven fan. Every unit easily removeable.

All other mechanical features of equally recognized ability.

Stewart delivery cars are built under the personal supervision of T. R. Lippard and R. G. Stewart, the originators of the first high-grade and scientifically designed delivery car.

Stewart Motor Corporation,
Buffalo, N. Y.

Please send catalog and dealer's proposition.

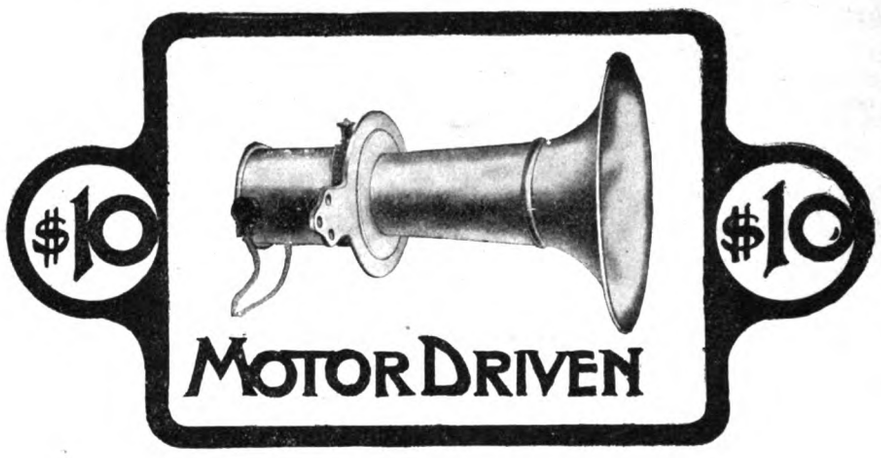
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Street .....

City..... State.....

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NEWTONE SUPERIOR
The King of Them All



1877 In Three Days OUR INITIAL SHIPMENT

As announced in our advertisements, shipments were started promptly on August 15th. Every finished "*Newtone Superior*" went out of our factory on that day. An avalanche of orders is being received from all over the country. "*Newtone Superior*" has met with instantaneous success and we are very proud of it.

It is the First Efficient Motor Driven Horn to Sell at a Popular Price.

Made and guaranteed by the largest auto horn manufacturer in the world. It has no equal—no real rival.

Our present "*Newtone Superior*" capacity of 275 per day will be doubled inside of three months.

The same guarantee of protection and service is given with "*Newtone Superior*" that goes with all other Newtone signals.

Car Manufacturers—Include "*Newtone Superior*" in your 1913 equipment. It will sell your cars.

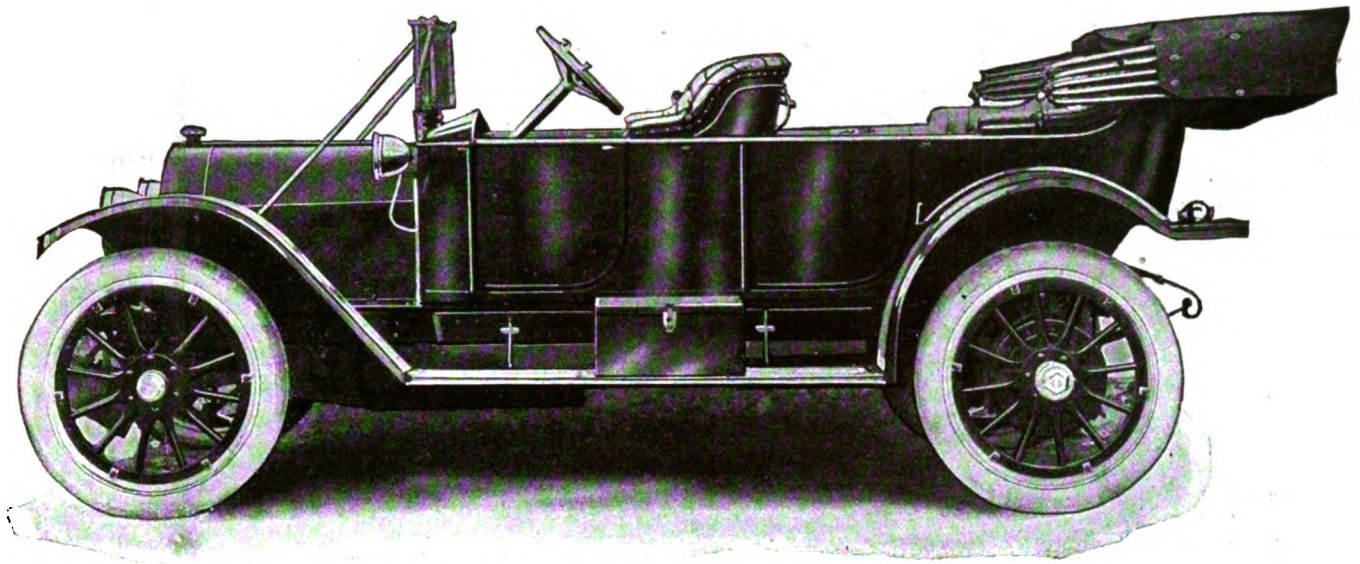
Dealers—"*Newtone Superiors*" will sell three to one. There's every indication of a phenomenal demand and you should be well stocked.

Shipments will be made as promptly as possible.

Automobile Supply Manufacturing Co.
220 Taaffe Place **BROOKLYN, N. Y.**

Incorporated 1904. Capital $500,000—fully paid in.

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Some Dealers Could Not Make Good on 75% Discount. It's the Prohibitive Selling Overhead That Kills the Profits.

Any DEALER can check up his ledger on "store rental," loss on "demonstrating cars," "operating expense," etc., but that isn't your REAL OVERHEAD. It's not the rent you pay or the cars you sell—it's the SALES YOU MISS—the ones you OUGHT TO MAKE that limit your possibilities.

How many AUTOMOBILES have been sold to date through modern, up to date selling methods? Isn't it a fact that most of the 700,000 cars in use were ACTUALLY BOUGHT by purchasers who CAME TO THE DEALER. Of course the best salesman—plus—the best car got the business, but that sort of distribution is not real salesmanship by the DEALER—it's buying by the consumer.

To date the problem has been that of DEMAND and the demand has been so great that the MANUFACTURER devoted his time to MANUFACTURING, depending on his DEALERS to sell the output and the DEALER has been so busy supplying the UNSOLICITED DEMAND that he has given no time to systematic selling.

Pullman Dealers Do Not Work in the Dark

The PULLMAN sales making machinery (blue print on request) locates his prospective purchaser and while the DEALER is making the sale, we are working overtime to locate the next prospect.

The PULLMAN line is a ready seller in any company. Wherever introduced they dominate the territory. There is no weak spot in the PULLMAN methods. We offer as much or more, dollar for dollar, than any other Manufacturer. Nothing is lacking in POWER, MATERIAL, SPECIFICATIONS, EQUIPMENT or ACCESSORIES to handicap the PULLMAN DEALER and in the matter of SELLING CO-OPERATION, TEAM WORK and PULLING TOGETHER the PULLMAN DEALER is years ahead of all competition.

May we send you our selling plan and printed matter of the 1913 Models?

4-36	4-44	6-66
$1675	$2150	$2750

Pullman Motor Car Company, York, Pa.

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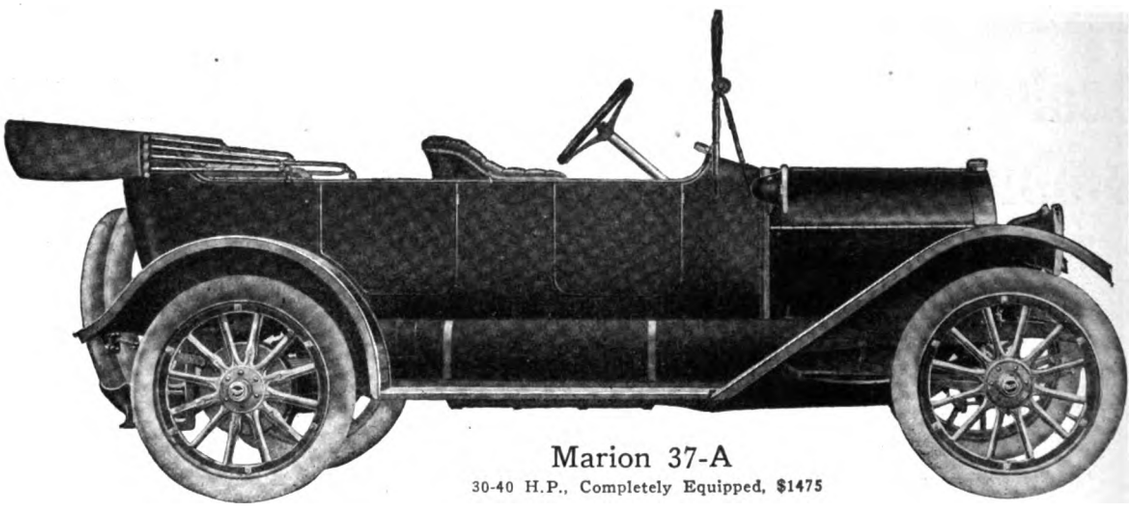
1913 Marion $1475

37-A

Disco Self-Starter.
Prest-O-Lite Tank.
Warner Speedometer.
Center Control.
Deep Upholstering.

Dynamo Electric Lighting System.
Q. D. Demountable Rims, one extra.
Ventilating Plate Glass Windshield.
Brewster Green or Deep Wine Color.
Mohair Top, Boot, Storm Curtains.

80-Hour Storage Battery.
Nickel Plated Trimmings.
Concealed Tool Boxes.
Tire Irons, Tools, Tire Kit.
112-Inch Wheelbase.



Marion 37-A
30-40 H.P., Completely Equipped, $1475

Here is the car which has caused the expansion of the Marion Motor Car Company. It is the car which will answer the actual demand of recent years for more Marion cars annually.

The Marion 37-A is representative of 10 years of Marion success. You'll enthuse over it. It has Style, Distinction and Class heretofore unknown among popular priced cars. You'll find its equipment unequalled, either in quality or comprehensiveness. Everything is included.

Its motor is powerful, silent and economical. Long wheelbase, springs of finest imported steel, and deep, comfortable unholstering insure easy riding. Self-starter, center control, electric lights, demountable rims, and other appointments make motoring in a Marion most delightful. Buy a Marion for your family.

Write for illustrated description of the Marion 37-A and other models. Just say on a postal "Send advance folder." Write it today.

To automobile dealers we offer the fairest sales agreement that has ever been written. Ask us about territory.

MARION MOTOR CAR COMPANY

Oliver Avenue **Indianapolis**

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Red Head

REGISTERED U.S. PAT. OFFICE

PLATINUM POINT MAGNETO PLUG



We will replace, free of charge, any RED HEAD Platinum Point Magneto Plug that fuses or corrodes from heat within 99 years, but no longer.

IF YOU expected any radical changes in the RED HEAD Platinum Point Magneto Plug, you will probably be disappointed.

Despite our vast experience, gained through powerful racing cars ranging from 30 to 210 H-P., we have found it impossible to improve upon the porcelain. Neither could we improve upon the design of the crimped cap, brass bushing, or the shell.

The RED HEAD Platinum Point Magneto Plug is a concession to motorists who use *super*-high tension magnetos and demand a greater margin of safety than to be found in imported meteor wire electrodes used regularly in RED HEAD Plugs.

The Platinum Point is 1-32" thick and will stand more than 3,000° of heat estimated ***four times greater than the hottest spark delivered by any magneto.***

All metal parts in the Platinum Point Plug are highly nickeled. Each plug is packed in a torpedo shaped wood box, decorated with a red, black and silver label and red top. The plug threads into the box, which protects the points and prevents disarrangement of the spark gap.

Price $2.00, including one set of RED HEAD SPARK PLUG WRENCHES free with every 4 plugs.

Emil Grossman Company, Manufacturer, 250 W. 54th Street, New York

Factory, 844 Woodward Avenue, Detroit

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"The Horn that's Made for the Discriminating"

TUTO HORN

THE TWO TONE HORN

Sold On Its Merits.

THE great popularity and the large sales of the TUTO horn have been brought about solely through the service value of this warning device, as shown, when operated on the motor car.

¶ The first and foremost advantage of the TUTO horn is the exclusive two-tone feature, which provides a low note for regular service, taking the place of the bulb horn, and a loud note for emergencies, both operated from the same button.

¶ Thus it is that the TUTO horn does all the signalling of the car and without any possibility of going wrong, as there is always time to increase the pressure on the button so as to make the loud emergency note if the low tone should fail to attract attention.

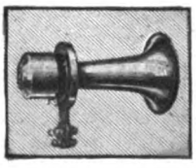
¶ All other electrical warning devices are of the one-loud-note type, which require the retaining of the bulb horn for the low service signal, or a one-note electric horn of medium loudness. This latter device usually is too loud for regular service and not sufficiently powerful for emergencies.

¶ The TUTO horn operates upon the same principle that you would make a request in an ordinary tone of voice, and an emergency demand, by shouting.

¶ Certainly you would not shout all of your ordinary requests.

¶ Neither is it necessary to use this scheme in operating your motor car warning signal, as the TUTO horn will give this low and loud note as required and without extra thought or confusion.

¶ This alone makes the TUTO horn the best for standard equipment and the first selection of the discriminating motor car owner.

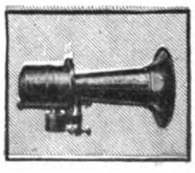


TUTO Horn, $25.00

The Dean Electric Co.

260 Taylor Avenue, Elyria, Ohio

"Look for Dean where Quality's seen"



TUTO-ETTE $17.50

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EXPERIENCE — SHELDON — RIGHT DESIGN

FACILITIES — AXLES — RIGHT STEEL

"Made in the Largest Axle Factory in the World"

Axle Talk—No. XVII

Axle efficiency is the sum total of GOOD DESIGN, plus good steel, plus good workmanship, and the biggest factor is design.

This statement is simply "reiterating the obvious" to the men who know the big difference in axle quality—or for that matter in quality of any part of the car.

But it still remains that, given high grade carbon steel and a fine equipment of men and machinery, the axle (or other part) is often a most pronounced failure.

An axle may embody strength but carry too much weight within itself—it may be incorrectly proportioned, developing weakness of unexpected points, under unexpected strain—it may be handsomely designed but fail to give service.

This is why we spell GOOD DESIGN in capitals—and the argument, while obvious, will bear repeating.

The Engineering Department of the SHELDON Axle Works occupies a position of strength and dignity in keeping with the importance of GOOD DESIGN.

It is at your service at all times.

SHELDON AXLE COMPANY, Wilkes-Barre, Pa.

CHICAGO OFFICE—68 East 12th St. DETROIT OFFICE—1215 Woodward Ave.

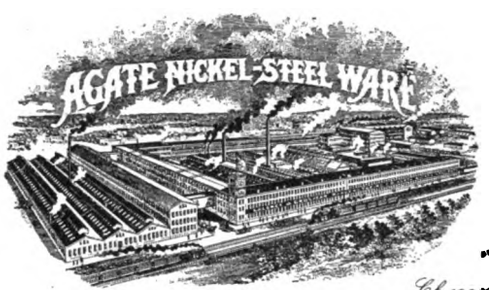
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Knox

Commercial Vehicles
WIN THE CONFIDENCE OF THEIR OWNERS



FACTORIES
Woodhaven, N.Y.
ROLLING MILLS TIN PLATE WORKS AND FOUNDRY
Harrisburg, Pa.



BRANCH HOUSES
Chicago Boston

L & G Mfg. Co. TRADE MARK

Lalance & Grosjean Mfg. Co.

CABLE ADDRESS "AGATECLIFF" NEW YORK
299 BROADWAY New York. May 24, 1912.

Knox Automobile Company,
1966 Broadway,
New York City.

Gentlemen:-

In reply to your inquiry asking for an expression from us as to our experience in the use of your motor trucks, would state that the fact that we have just placed a new order with you for six 4-cylinder, Model "R-15", 3 ton trucks, should be sufficient evidence that our experience with your trucks in the last five years had been most satisfactory.

We have used Knox motor trucks exclusively for over five years and as we have used no other make, can give no comparison as to the efficiency, up-keep, etc., but it is sufficient to state that our experience with your machines has been so satisfactory we have just placed with you the above order. Our experience with your machines and the courtesies extended by your company have been so satisfactory that we take pleasure in adding our testimonials to the many others you already have.

Very truly yours,
LALANCE & GROSJEAN MFG. CO.

J.H.W./B. President.

Send for Catalogue "W"

KNOX AUTOMOBILE COMPANY, Springfield, Mass.

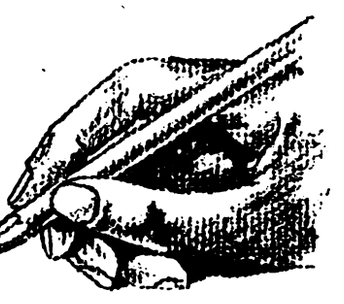
New York—BRANCHES—Chicago

"Recognized as America's Highest Standard Since the Beginning of the Industry"

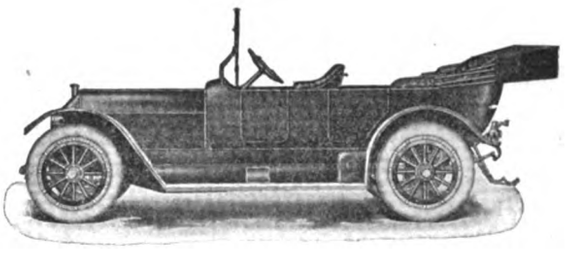
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My next Car will be a Knox

"Little Six



The Writing on the Wall



A Distinctive Car of Exceptional Merit

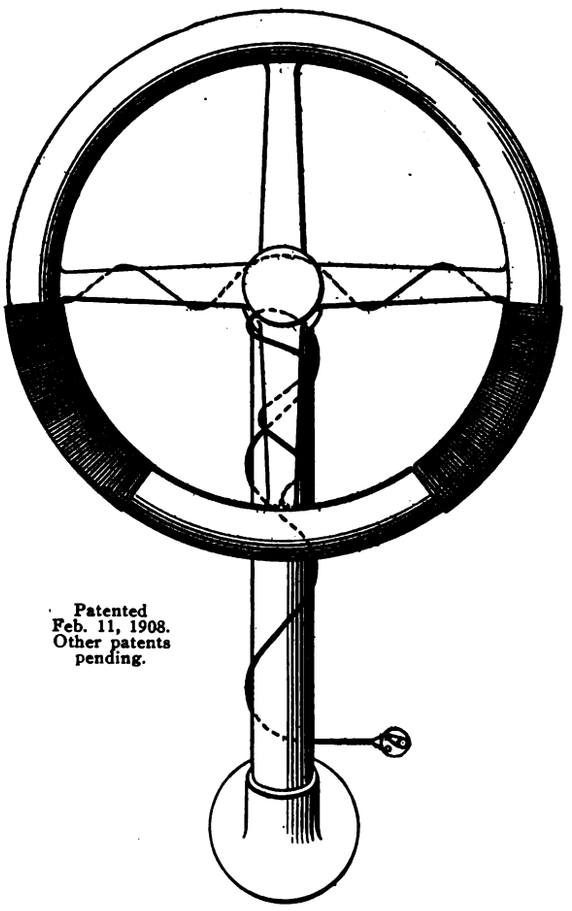
Send for Advance Folder "M" of 1913 Models

KNOX AUTOMOBILE COMPANY, Springfield, Mass.

New York — BRANCHES — Chicago

"A Demonstration is Irresistible"

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Patented
Feb. 11, 1908.
Other patents
pending.

Here is an electric heating device that can be attached to any steering wheel

THE illustration herewith shows the latest product of the Warm Hand Steering Wheel Company—an electric heating device, which is wrapped on the outside of the steering wheel, and which can be applied in twenty minutes time without alteration to any car.

As is indicated in the cut the heating coil is wound around part of the lower half of the steering wheel, and is connected by means of a pair of flexible wires to the battery or dynamo in the car.

The controlling switch by which the electricity is turned on and off is located on the dash, or in any other accessible position. This switch is very small and neat, and the controlling lever is detachable so that it can be removed when the operator leaves the car.

This heating device is not in any way cumbersome, and its presence on the steering wheel does not interfere in any way with the free and easy handling of the wheel. As a matter of fact the heating device not only acts as a heater, but it serves as an added grip on the wheel.

The current consumption is so small as to be a negative quantity and in no case will it injure your electric system in the slightest degree. This system is especially adaptable to Ford cars, for the current supplied by the Ford inbuilt magneto is greatly in excess of what is needed for both the operation of the car and the heating of the steering wheel.

This heating device ready to install on the car retails for $7.50. In ordering state the make and model of the car.

DEALERS AND JOBBERS!

Don't consider this proposition as just one of the thousands put up to you every day, by Tom, Dick and Harry.

This is a truly remarkable chance for a few of the real progressive dealers and jobbers in this country to pick out a "gold mine."

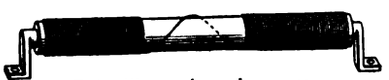
Here is an accessory that is exclusive. Not a competitor on the market. An accessory that is being sought by every person who owns a car.

Our advertising campaign will tell every car owner that they can be as warm driving in winter as in summer.

Do you think there'll be a big demand for these heating devices?

We're going to be represented in your territory. Why not by you?

The Warm Hand Steering Wheel Co.



This illustration shows an adaption of the electric heater applied to a foot rail which sells for $7.50.

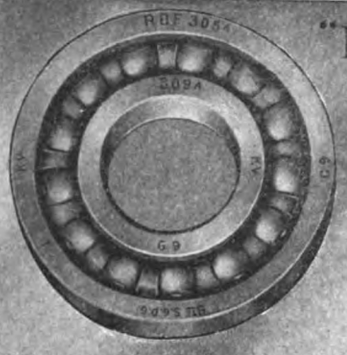
527 Fifth Avenue

NEW YORK

WARM HAND WHEEL

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R.B.F. BALL BEARINGS



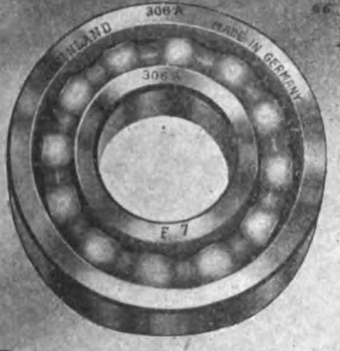
"INSURANCE FOR BUILDER AND USER"

A FEW USERS:

PANHARD
RENAULT
CLEMENT-BAYARD
DELAHAYE
PEERLESS
DARRACQ
PEUGEOT
HOTCHKISS

HUDSON EXPORT & IMPORT CO.
STUART R. SHEPARD, SUCCESSOR
140 WEST 42ND ST., NEW YORK, N.Y.

RHINELAND BALL BEARINGS



"INSURANCE FOR BUILDER AND USER"

A FEW USERS:

MINERVA
ENGLISH DAIMLER
STODDARD-DAYTON
METALLURGIQUE
AMERICAN
MERCER
KISSEL KAR
CALTHORPE

RHINELAND MACHINE WORKS CO.
140 WEST 42ND ST., NEW YORK, N.Y.

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Any car at any price which you choose to compare with this new Cadillac will be honored by the comparison

Long stroke engine. More Power Silent Chain-driven camshaft; enclosed valves; quiet engine. Longer wheelbase; larger tires; Electrical system of automatic cranking, lighting and ignition simplified and improved; automatic spark control. Numerous refinements of essential details

You will bear witness that the Cadillac case has never been overstated.

Hold to that thought, please, in considering what we shall say of this new car.

Cadillac practice has progressively improved upon itself season after season.

It has now reached a point, which, we believe, warrants us in thinking that comparison of the choicest cars with the Cadillac will hereafter confer a distinction upon those cars, rather than otherwise.

For several years we have calmly observed the rapid rise of the Cadillac in public opinion.

Each year we have seen the little group of its equals in popular esteem narrowed down.

Each year we have seen a higher and higher price named as the basis of comparison with the Cadillac.

And we believe that basis of price comparison is about to vanish altogether.

We believe that the last mental reservation is about to remove itself from the public mind.

We ourselves have felt serenely sure for a long time that in point of real and substantial value the line of demarcation between cars of highest price and the Cadillac was an imaginary line.

We have felt that it was written in water, like the international boundary lines in the ocean—and we feel that this new Cadillac will complete the process of so convincing the public.

The advent of such a car at the Cadillac price is, of course, a matter of genuine moment; and you will be interested, therefore, in this news concerning it.

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A few of the improvements in the 1913 Cadillac

LONG STROKE ENGINE:—4½" bore by 5¾" stroke, increasing the power of the always extraordinarily efficient Cadillac engine. This amplification of power is especially observable at speeds from 12 to 35 miles an hour, dynamometer tests registering an increase of from 18 to 25 per cent.

SILENT CHAIN-DRIVEN cam shaft, also pump and generator shaft, replacing meshed gears, in conjunction with:

ENCLOSED VALVES, and the superb workmanship throughout in which the Cadillac has always excelled, producing an engine which runs with unusual quietness.

CARBURETOR:—A carburetor of marked efficiency and simplicity has been further simplified, now requiring but a single means of adjustment, removing from it to the greatest possible degree, the necessity of attention.

AUTOMATIC ELECTRIC CRANKING DEVICE, ELECTRIC LIGHTS, IGNITION:—A vastly simplified and improved Delco system developed at the instigation of the Cadillac Company for Cadillac cars, the result of experience with the old system on twelve thousand 1912 models.

While the old system demonstrated itself to be by far the most efficient for its purposes that had ever been developed, the Cadillac Company has evolved means of increasing that efficiency to as near the 100 per cent point as any mechanical appliance could be. Among the simplifications are, the successful adoption of the single instead of double voltage system, thereby eliminating the controlling switch, the meter, much wiring and other parts. The meter is replaced by a voltage regulator which automatically governs the charging rate of the battery, reducing to an absolute minimum the attention required on the part of the user. The switches for starting, lighting and ignition, the latter equipped with Yale lock, are more conveniently located. Lights are provided with fuses. These and other advantages will be enjoyed by users of the 1913 Cadillac.

AUTOMATIC SPARK CONTROL:—Relieving the driver of the necessity of constant attention in order to secure the maximum results.

LONGER WHEELBASE:—The easy riding qualities of a car which has been regarded as the acme of luxury are accentuated by an increase in the length of the wheel base from 116 to 120 inches, and a corresponding increase in the length of rear springs.

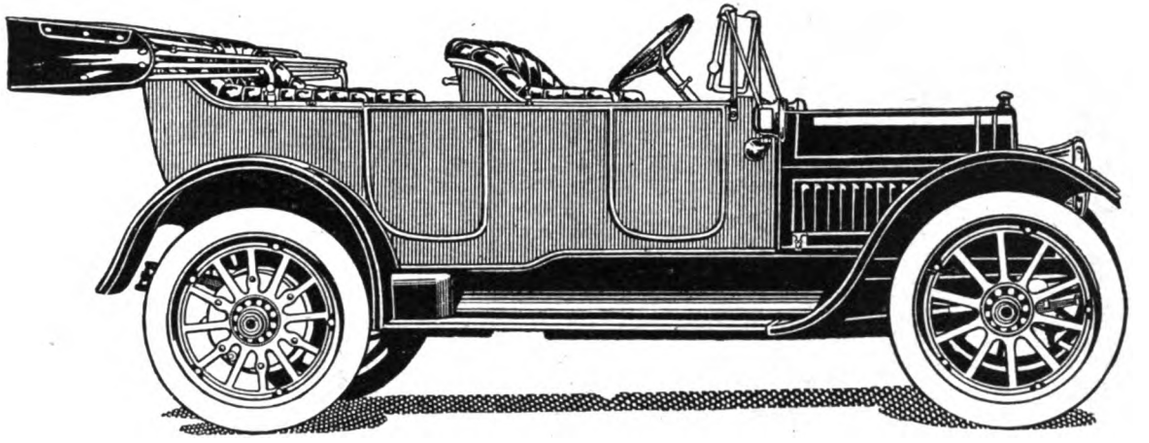
TIRES:—Increased from 36" x 4" to 36" x 4½", with the obvious advantages resulting therefrom. Demountable rims.

EQUIPMENT:—Cadillac top and windshield included. See specifications.

THE MOTOR WORLD

SPECIFICATIONS IN BRIEF.

ENGINE—Long stroke, 4½-inch bore by 5¾-inch stroke; four-cylinder, silent chain-driven cam shaft also pump and generator shaft, enclosed valves. Five-bearing crankshaft. **HORSEPOWER**—40-50. **COOLING**—Water, copper jacketed cylinders. Centrifugal pump; radiator tubular and plate type. **IGNITION**—See "Equipment." **LUBRICATION**—Automatic splash system, oil uniformly distributed. **CARBURETOR**—Special Cadillac design of maximum efficiency, water jacketed. Air adjustable from driver's seat. **CLUTCH**—Cone type, large, leather faced with special spring ring in fly wheel. **TRANSMISSION**—Sliding gear, selective type, three speeds forward and reverse. Chrome nickel steel gears, running on five Hess-Bright ball bearings; bearings oil tight. **CONTROL**—Hand gear-change lever and emergency brake lever at driver's right, inside the car. Service brake, foot lever. Clutch, foot lever. Throttle accelerator, foot lever. Spark and throttle levers at steering wheel. Carburetor air adjustment, hand lever under steering wheel. **DRIVE**—Direct shaft to bevel gears of special cut teeth to afford maximum strength. Drive shaft runs on Timken bearing. **AXLES**—Rear, Timken full floating type; special alloy steel live axle shaft; Timken roller bearing. Front axle, drop forged I beam section with drop forged yokes, spring perches, tie rod ends and roller bearing steering spindles. Front wheels fitted with Timken bearings. **BRAKES**—One internal and one external brake direct on wheels, 17-inch by 2½-inch drums. Exceptionally easy in operation. Both equipped with equalizers. **STEERING GEAR**—Cadillac patented worm and worm gear, sector type, adjustable. 18-inch steering wheel with walnut rim; aluminum spider. **WHEEL BASE**—120 inches. **TIRES**—36-inch by 4½-inch Hartford or Morgan & Wright; demountable rims. **SPRINGS**—Front, semi-elliptical. Rear, three-quarter platform. **FINISH**—Cadillac blue throughout, including wheels; light striping, nickel trimmings. **STANDARD EQUIPMENT**—Cadillac mohair top, wind shield, Delco patented electrical system embodying automatic cranking device, electric lights and ignition. Automatic spark advance. Also Delco distributor ignition system. Gray & Davis lamps especially designed for Cadillac cars, black enamel with nickel trimmings; two headlights; two side lights, tail light. Hans gasoline gauge on dash; horn; full foot rail in tonneau; robe rail; tire irons; set of tools, including pump and tire repair kit; cocoa mat in all tonneaux except closed cars. Speedometer, Warner, with electric light.



STYLES AND PRICES

Standard Touring Car, five passenger.....$1975.00

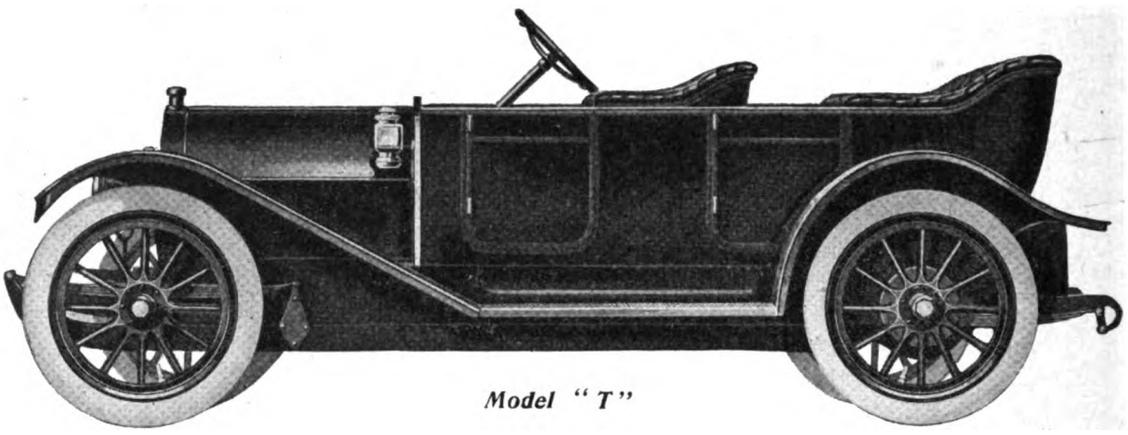
Six passenger car	**$2075.00**	**Roadster, two passenger**	**$1975.00**
Phaeton, four passenger	**1975.00**	**Coupe, four pasesnger**	**2500.00**
Torpedo, four passenger	**1975.00**	**Limousine, seven passenger**	**3250.00**

All prices are F. O. B. Detroit, including standard equipment

CADILLAC MOTOR CAR CO. - Detroit, Mich.

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"Efficiency" In Its Relation To The Dealer Who Sells Automobiles



Model "T"

The New Regal Underslung Touring Car "25" H. P. $950

EFFICIENCY is a world slogan, everywhere men are discussing methods that shall increase results and improve products. They are not only figuring how to save labor and expense but how to make labor more profitable to themselves and their workmen. All this has a natural tendency to increase the quality of manufactured articles and to reduce the selling price to the purchaser. We have something important to say about **efficiency** as it affects dealers who sell Regal Motor Cars or who should be selling them.

EFFICIENCY IN DESIGN. Motors cars differ in design. Some are more **"efficient"** than others. We mean by this they vary in the amount of comfort they give, in the economy of upkeep they provide and in the appearance they present to the eye. But there is a car illustrated above that embodies more **efficiency** to the square inch than any other car we, as manufacturers, know of. Being an "Underslung" it is the superior in **efficiency** of any ordinarily built car—more **efficient** in "Safety," in easy riding ability, in "Economy," owing to level motor suspension, a straight line shaft drive, and prevention of side-lash on springs and tires. More **efficient** in "Beauty" and "Accessibility." It is the most **efficient** car because it is an Underslung, the most advanced engineering practice in design.

EFFICIENCY IN PRICE. The day has gone for high prices. The majority—the big buying public desires a moderate priced car. This new Regal "25" Underslung Touring Car is the most **efficient** car in the country in regard to price, because it gives **more** and costs **less** than any other car in its class. The car itself will prove it—comparison will prove it—its selling cost—$950 against its constructional quality, its power-plant, its size will prove it.

EFFICIENCY IN SERVICE. Two kinds of service—the factory service to dealers **behind** the car and the service **in** the car to purchasers. Regal Warehouses carrying supplies of cars, and supplies of every working part, are placed at strategic points all over the country for the benefit of Regal Dealers. No long waits; satisfied owners through a satisfying service is the Regal method of working **with** and **for** Regal Dealers. Then, the other kind of service this car will give owners. It will give in utility, pleasure and speed, all or more than cars costing twice as much.

EFFICIENCY IN COMPETITION. We mean business getting, car selling for dealers. The easiest car on the market to sell because it hasn't any competition. This car, at this price, with Regal service **behind** and **in** it, means bigger dividends upon your investment than any other car you drudge to sell. It adds **efficiency** to your business, a quicker turn-over, a larger volume, because it is the car the people **want** and can **afford** to buy.

EFFICIENT DEALERS SELL THE EFFICIENT CAR. Hundreds of enthusiastic dealers, men who should succeed, go out of the automobile business every year. They fail because they do not recognize this fact of **efficiency**—they do not sell the **efficient** car. They happen to represent an ordinary car that has to compete with the "out-of-the-ordinary" car. This new Regal "25" Underslung Touring Car at $950 is not only an "out-of-the-ordinary" car, it is an "extraordinary" car in any competition.
MORAL—then be a Regal Dealer.

EFFICIENT SPECIFICATIONS. Motor 25 H. P. 3¾ x 4½; wheel base 106 inches. Magneto and batteries (dual ignition); transmission (selective) highest grade nickel steel. Three speeds forward, one reverse; Morgan & Wright Tires, 32 x 3½. Standard Equipment. Five Lamps, Generator, Horn, Complete tool equipment. (Folding Glass Windshield and Mohair Top and Top Boot $50 extra.)

OTHER REGAL UNDERSLUNGS—The famous Regal "25" Underslung Roadster $900. The equally famous Regal "25" Underslung Colonial Coupe, $1250. The Regal "35" Underslung Touring Car $1400.

The Regal Motor Car Company, Automobile Manufacturers **Detroit, Michigan**

FOREIGN DEPARTMENT—18 Broadway, New York

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The Story of the Red, White and Green Lights

Shining bright through the haze of the heat-treating room are the signal lights at each furnace. They tell a serial story to the furnace men. One that keeps them on tip-toe with interest. It's a story full of constant alertness in the heat-treating of



White light glowing tells the watcher "all's well!" Red light alone warns "the oven's too hot!" Green shouts an order to "turn on more fire!" White and red together say "a trifle too warm." White with green means "a trifle too cool."

A "trifle," it should be explained, is less than ten degrees variation from a temperature of close to two thousand degrees Fahrenheit.

The Reason for the Lights

It's important—vitally so—that the axle parts be subjected to a uniform heat for a definite length of time.

A different temperature and time for each particular part according to its size, and use, and the kind of steel from which it is made.

These "just right" degrees of heat and lengths of time have cost long years of experience.

There must be no slip at the ovens.

So electric resistance thermometers in the ovens tell the temperature with no opening of doors and chilling of parts.

The "pyrometer man" reads the temperature of each furnace every fifteen minutes, and records his readings on a long white sheet.

Then he signals to the furnace men and his orders are promptly obeyed.

An Addition to the Value of Correct Design

Correct design of course comes first in importance.

Timken engineers are specialists in axle design. Timken experience, uniformly successful, runs back to the dawn of the industry, and before that with horse-drawn vehicles.

Almost equal in importance is the organization. The Timken-Detroit organization is composed of men of ability, men of integrity, men who are fired by enthusiastic devotion to one ideal—the making of the best possible axles.

The story of the red, white and green lights is just one of many stories of Timken-Detroit integrity in manufacture.

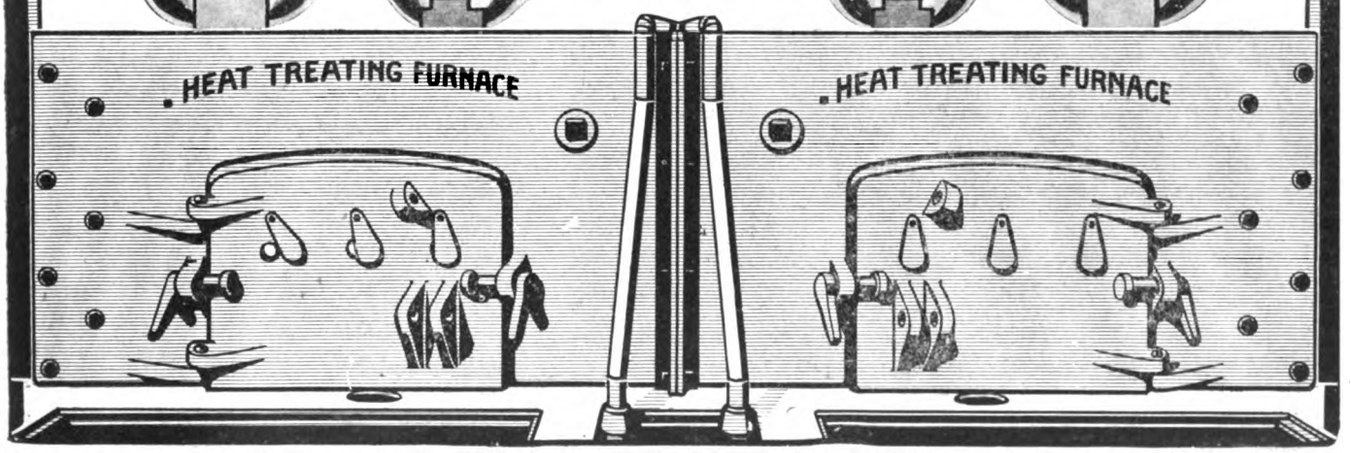
And it is this integrity, this extreme care in the making that adds to correct design an unseen value.

It is this unseen value even more than the seen, that enables Timken-Detroit Axles to give such satisfactory service under the cars of over a hundred leading pleasure and commercial car builders.

The Timken-Detroit Axle Company

15 **Detroit, Michigan, U. S. A.**

The only axle manufacturer licensed to make axles equipped with the famous Timken Roller Bearings



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Reliance The Speedometer of Quality

Reliance Speedometers have made good

Steady — accurate — durable — beautiful — these four attributes have made for this speedometer a name that stands for quality.

¶ The swivel drive, spiral gears, cut tooth ring gears and fibre tooth pinion insure against strain, friction and inaccurate registration.

¶ Direct connection between wheel and indicator secures a steady hand at every speed and regardless of road conditions.

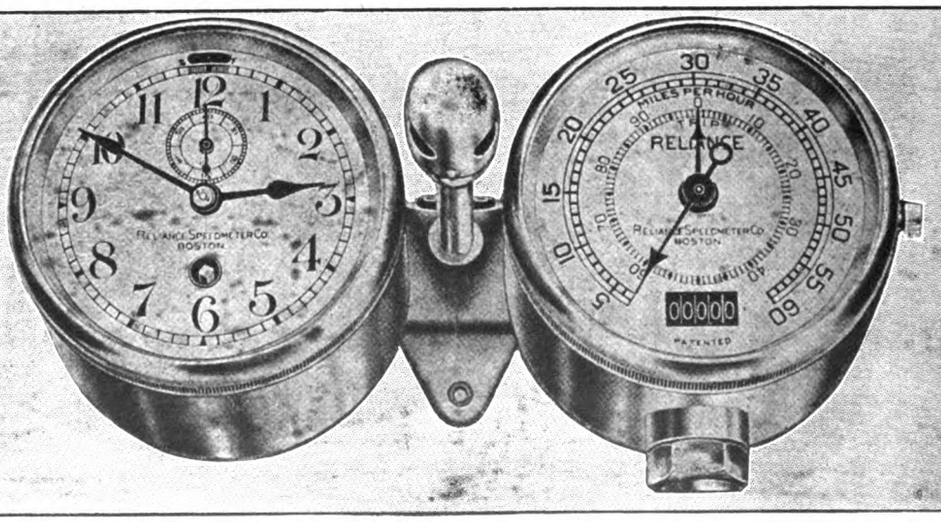
¶ Flexible shaft suspended on ball bearings eliminates shaft breakages, jumping indicators and makes for quiet and smooth running.

¶ We utilize the centrifugal principle of indication because we have proved that it is the most reliable and simplest, having few parts and depending on a well established mechanical principle.

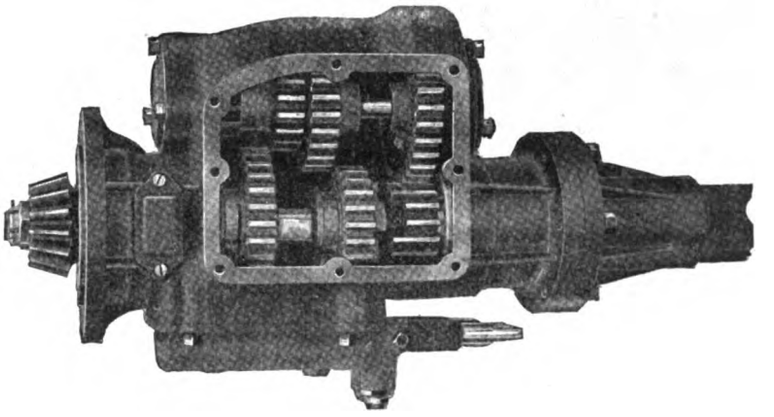
¶ Design, material, construction methods and finish all unite to produce an unusually dependable and accurate speedometer at a price within reason.

¶ Send for our handsome illustrated booklet showing different models with prices.

RELIANCE SPEEDOMETER COMPANY
134 Eliot Street **Boston, Mass.**



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TRANSMISSIONS suggest COVERT—COVERT implies QUALITY!

YOU ARE ALL familiar with the name "COVERT TRANSMISSIONS."

SOME OF YOU have learned that it stands for QUALITY at QUANTITY PRICES. You know thousands of them are in use—You know they are RIGHT.

SOME OF YOU have learned that although we stand back of them with a broad and liberal guarantee, it's mighty seldom, if ever, that we are called upon to make it good, because, while light and compact, they are sturdy—the sturdiness born of correct design and the best of material and workmanship.

SOME OF YOU have learned that we furnish your transmissions at less than they would cost you to build, although you spent thousands for machinery to do this work.

SOME OF YOU are contemplating a similar expenditure. WHY not profit by the other fellow's experience—at least to the extent of investigating? Put it up to us—we believe we can show you.

Covert
Motor Vehicle Company

Factory: Lockport, N. Y.

Sales Office: Ford Bldg.
Detroit, Mich.

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JENCICK

QUALITY MOTORS FOR HIGH GRADE TRUCKS



Are you building trucks for present increment or for prestige that goes with a machine that puts competition in a bad light when length of service and shortening of repair bills are considered?

THE DESIGNER of Jencick Motors was trained in the shops of Daimler and De Dion—both institutions that work on one fixed line—that of "quality production" in which cost consideration plays a small part.

In the building of Jencick motors we have adhered to this policy. "Good materials first." Advanced design and modern refinements coupled with ordinary steel, iron and aluminum cannot produce an engine that will "stand up."

Take just one Jencick feature.

The engine base is manganese bronze.

The material costs us three times as much as aluminum or cast iron—and it is seven times as strong.

The average "good behavior" period of the aluminum base is one year, and even within that time, it will often weaken, throwing shafts and bearings out of alignment, with chewed up bearings, noise and frequent "taking up" as sure results—creating trouble and repair bills big enough to make the man who owns it a mighty poor advertiser for your truck.

The manganese bronze base will hold the working parts true under all conditions of hard work and rough usage, and for all time, but—

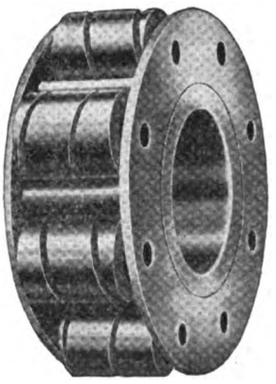
It is an added item of cost of production—one of many that makes it impossible for us to get into the competitive field with manufacturers of ordinary motors.

This page is not an apology for Jencick prices—it is an advertisement for quality that means service and satisfaction, and, after all, you, Mr. Truck Manufacturer, sell or ought to sell these factors principally—and a truck incidentally.

More to follow—but write to us NOW if you are interested.

JENCICK MOTOR CORPORATION, PORTCHESTER, N. Y.

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Service

DO YOU BUY BRAINS when you make a contract, or do you just agree to pay real money for nicely finished material delivered at your factory? In other words, does real tangible Service go into every part of your car along with the wood and metal?

BEARING SUCCESS DEMANDS that the bearing manufacturer supply the car builder with three distinct service features. Briefly they may be described as follows:

FIRST: THE SALESMAN must be honest and intelligent in advising the prospective user as to the types and sizes best suited to his requirements. Steady contact with designs of every nature and the results obtained from them have equipped him with a special knowledge. This is worth much to the designer.

SECOND: THE ENGINEER should be brought into personal contact with every proposition as early as possible. Each installation must be watched closely to assure to the user the very latest and best ideas, not only laid out in the drafting room but actually executed in the shop.

THIRD: THE INSPECTOR, by calling regularly on automobile dealers all over the country, in addition to calling frequently at the factories where bearings are being continually used, is able to notice and correct the little things which might otherwise grow to be real faults. In this way, then, mechanically, the car user is protected almost to a degree.

HYATT SUCCESS JUSTIFIES the statement that Hyatt Flexible Roller Bearings are backed by just the service pictured above. No essential is omitted. And further, a liberal company policy, coupled with eminently fair treatment for all—insures both to builder and user perfect satisfaction.

HYATT ROLLER BEARING CO.
DETROIT, MICHIGAN

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70% MORE TIRE MILES

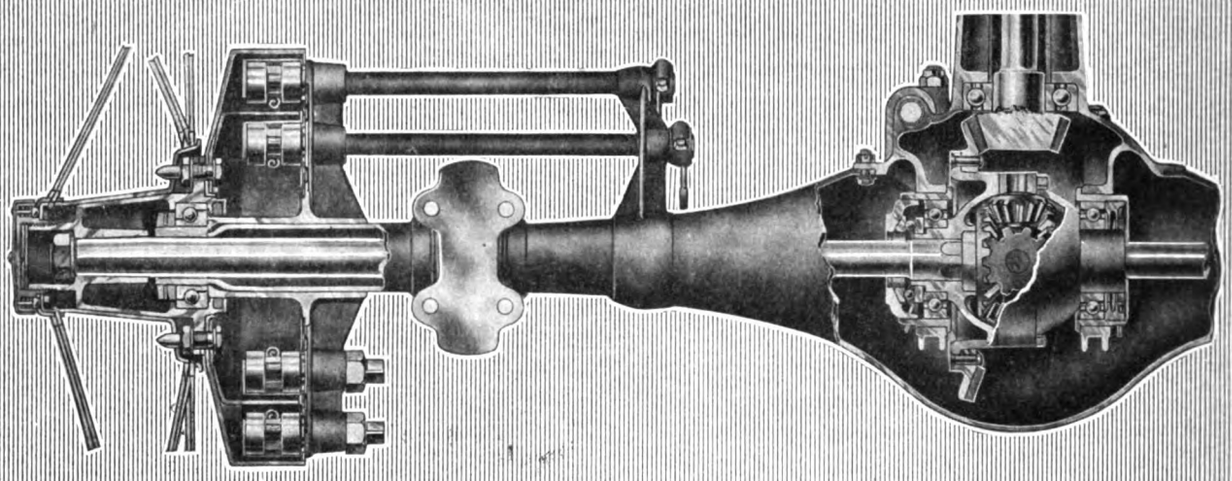
WIRE WHEELS

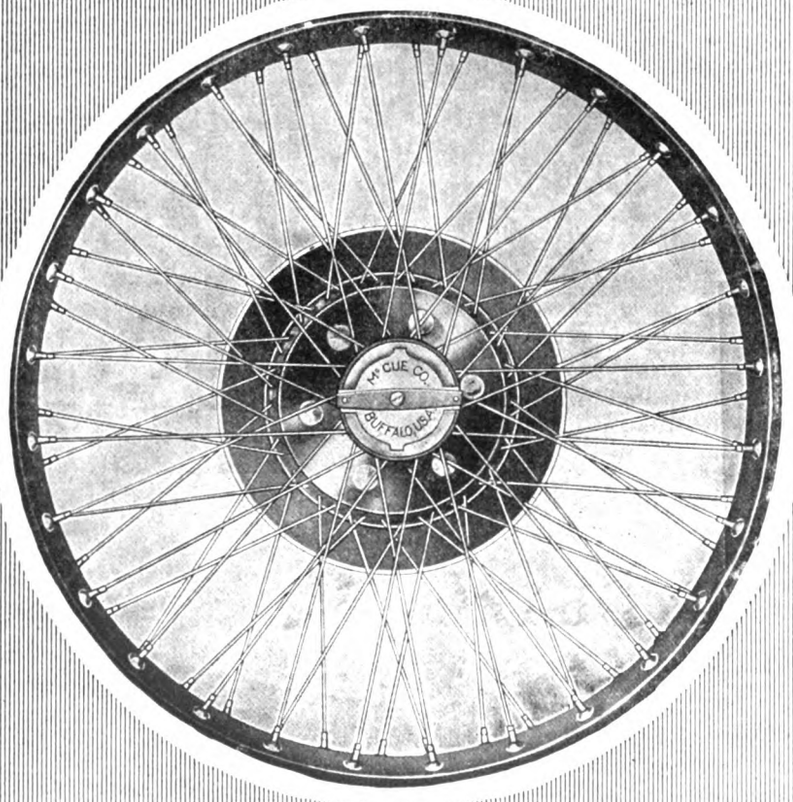
McCUE

McCue Axles are Dependable Axles

The rear axle housing is made in one piece from end to end without reinforcements. Although this steel housing weighs not to exceed 50 pounds, the carrying capacity without stress is over twenty thousand pounds. The design is such that the housing forms its own truss.

McCue axles are made to take either wooden or wire wheels on the same spindle.





WHILE McCue Wire Wheels have shown up wonderfully in racing contests of all sorts and descriptions, the idea should not obtain that they are especially adaptable to racing conditions. We have cited racing victories only because they illustrate extreme cases of tire wear and tear. If wire wheels will save tires under the terrific abuse of a race, they certainly will effect a tremendous saving in general use. Practically all of the leading foreign cars are wire wheel equipped for private use.

McCue detachable wire wheels do away with your heavy, bulky, impracticable demountable rims and are much easier to mount and demount than any demountable rim ever made.

The McCue Company
BUFFALO, NEW YORK

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1/4 MILLION

EXHAUST TUBES IN TWELVE MONTHS

We made this enormous quantity because we received orders for them. We received orders for them because we can make them better, cheaper and quicker than any one else.

We make them better because we have the most up-to-date machinery and employ only expert workmen.

We make them cheaper because we make our own tubing and make so many.

We make them quicker because we know how to make them and do not fuss, fret or fume if the job is new or a "sticker."

Our tubes are strong, accurate to dimensions and very light in weight.

It is not foolish to make your own tubes, but it's futile, especially when you can get what you want without wandering.

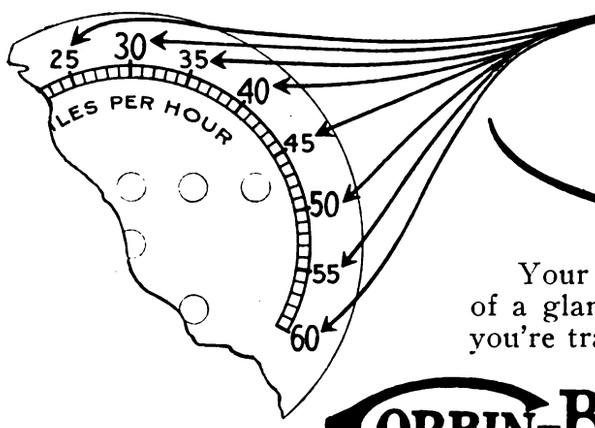
THE STANDARD WELDING CO.

CLEVELAND, OHIO

NEW YORK CHICAGO DETROIT

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The figure "10" and its multiples are almost twice the size of the figure "5" and *its* multiples



This contrast insures easy and accurate reading. Can be read from the rear seats.

Your eye doesn't "hunt" the figures—the quickest kind of a glance at your speedometer tells you exactly how fast you're traveling—if it's a

CORBIN-BROWN SPEEDOMETER

"the speedometer of *permanent* accuracy"

Constructed on the centrifugal principle. Not subject to inaccuracies due to climatic changes—a fault common to magnetic types.

Records from 2 miles an hour to 80.

Compound governors make it doubly sensitive to the wheel.

Every Corbin-Brown calibrated by hand and tested for absolute accuracy.

ORDER OF YOUR JOBBER. WRITE FOR CATALOG 213

CORBIN SCREW CORPORATION DIVISION *(American Hardware Corporation)* **New Britain, Connecticut**

For sale by dealers everywhere. **DISTRIBUTORS: New York, Philadelphia, Chicago**

The New Twitchell Positive Lock Stop Air Gauge

A gauge that will outlast and outwear any other device of its kind on the American market.

Above all, it's the only gauge that will register accurately always—regardless of age and usage—this for two reasons—

First—The Twitchell Gauge is all metal, containing no rubber washers or other perishable material, which deteriorates and wears out in a few months.

Second—There is positively no wear or friction on internal or external parts.



The Lock Stop Feature

Use this device whenever you want to—on darkest roads or dimly lit streets. It will remain at pressure until you are ready to put it back to zero—for five minutes or a year—just as you please.

The Twitchell Gauge

tells your tire pressure story—with it you can get more mileage out of the tires, because you can always keep them at right pressure.

The Twitchell Gauge is tire insurance for a dollar—order one from your dealer or from us direct.

THE TWITCHELL GAUGE COMPANY

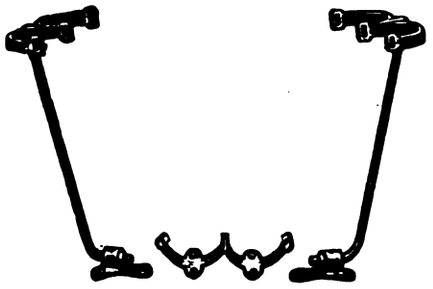
1256 Michigan Boulevard **CHICAGO, ILL.**

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The Largest Automobile Supply House in America

FIFTEEN STORES IN THE UNITED STATES

"Torpedo" Tire and Demountable Rim Holders



Designed especially for use on Torpedo body or Fore-door cars. Set consists of two strong arms firmly bolted to running board and permitting of sufficient adjustment to accommodate two tires or demountable rims, of standard sizes, 4 inch or smaller. Made of solid Brass and guaranteed to give perfect satisfaction.

Finish: Furnished in Hard Rubber Black Enamel finish, and full Polished Brass.

	Brass	Black
Price, complete with Straps...	**$4.00**	**$3.00**

A dozen other styles and sizes in stock. See catalog.

Our 1912 Catalog, which is held as a book of reference by manufacturers, dealers and automobile owners, will be mailed on request. Circulation limited to 100,000 copies.

Chas. E. Miller

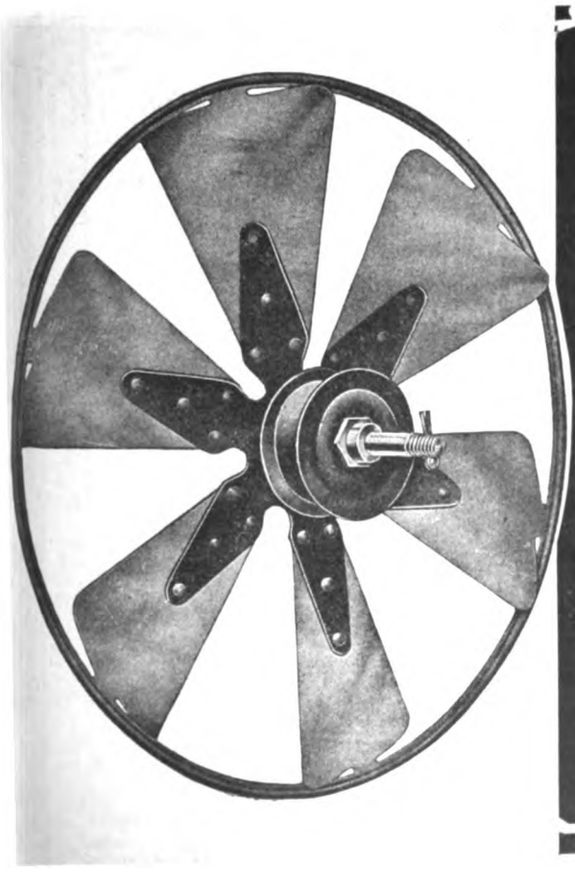
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Protect yourself where deliveries are assured, quality right and a saving made because of an assortment of standard parts from which you may draw.

We Are Fan Specialists

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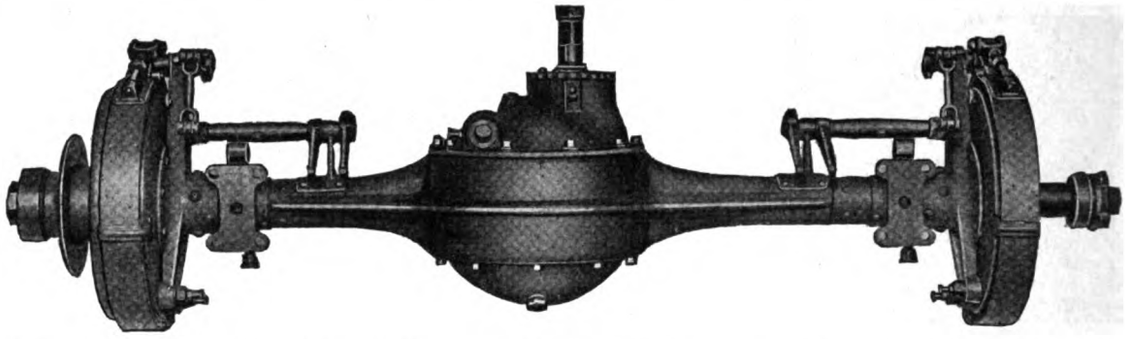
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American Axles

For All Types of Electric and Gasoline Cars



Whether you wish a Bevel Gear or Worm Drive, there is an *American Axle* that will give you the highest degree of efficiency.

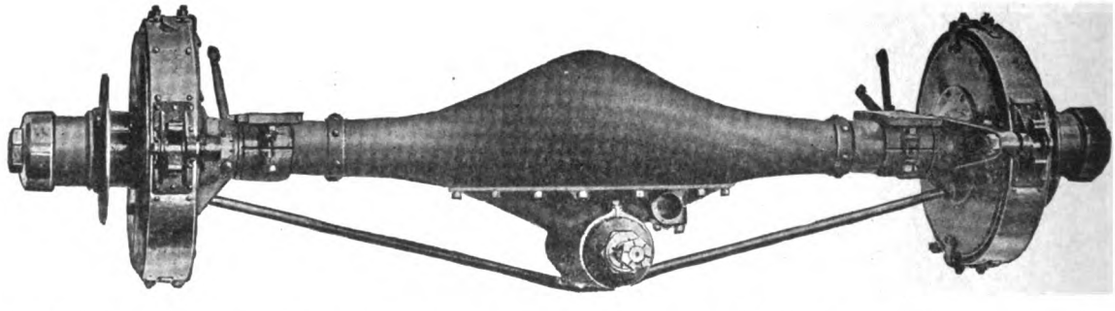
The pioneer builders of Bevel Drive Axles, we are also builders of the best known Worm Drive—the Lanchester-Daimler—holding through the Warner Gear Company, of Muncie, Ind., the exclusive American rights as axle manufacturers of these famous English gears.

American Axles owe their superiority to features designed and protected by us, and which are fully covered by letters patent.

They are easy running and easy steering because of those features, thus proving the superiority of their design and excellence of workmanship.

American Axles have waged war on friction for many years; their foremost position in the automobile world has been won solely on performance.

Your car should have *American Axles* because their efficiency spells economy to you.



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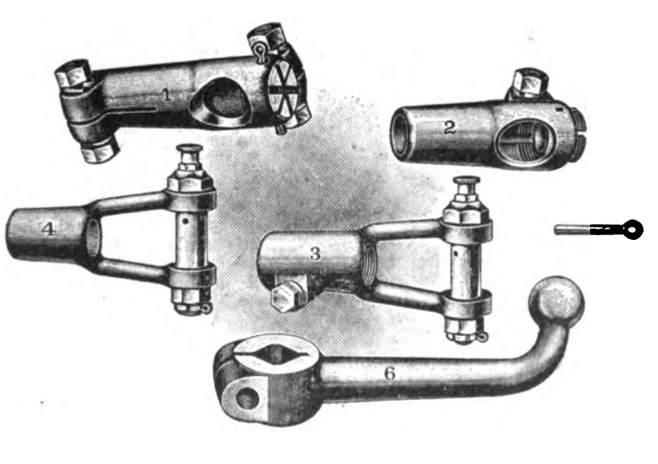
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As long as pneumatic tires are made of rubber their serviceability will be determined by the quality of that rubber.

The average mileage of Kelly-Springfield Automobile Tires stands a thousand or two above the average mileage of the average tire. It ought to—for since 1895, when we started out as the first manufacturers of rubber vehicle tires, our experience has enabled us to develop for Kelly-Springfield Tires a tough, long wearing composition of rubber that is pretty close to perfection.

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Adopted as the Standard by Many of the Leading Car Manufacturers of the Country.

Drop-Forged of 25 to 30 Carbon O. H. Steel

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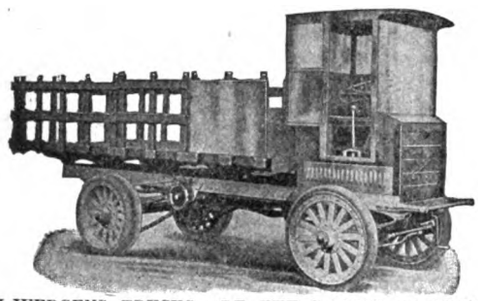
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Lauth-Juergens Trucks are Delivery Insurance

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ONE, TWO AND THREE TON CAPACITY



LAUTH-JUERGENS TRUCKS ARE THE LATEST IN CONSTRUCTION, most powerful in operation and the motors are guaranteed against defective workmanship and material for the life of the truck. They are positively the highest class trucks made. Two cylinder, one-ton, four cylinder, one, two and three-ton. Four speeds forward. Hess-Bright ball bearing transmission made in our own shops of the finest tool steel, three-piece disc clutch, covered by patents owned by us. Send for 1912 Catalog and specifications. Prompt delivery on all models. Large publicity campaign just begun. Our quality will do the rest.

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INTERLOCK INNER TIRES

Stop Tire Troubles

INVESTIGATE AND LEARN WHY SO MANY THOUSANDS OF MOTORISTS ARE DISCARDING INNER SHOES, RELINERS, FILLERS, AND OTHER MAKESHIFTS FOR INTERLOCK INNER TIRES—AND WHY INTERLOCKS ARE HANDLED AND RECOMMENDED BY THE BEST SUPPLY DEALERS AND TIRE HOUSES ALL OVER THE COUNTRY.

One weak point of the automobile to-day is that you can't depend on its tires. INTERLOCKS revolutionize this condition by making your tires so strong that blowouts become practically impossible. INTERLOCKS save half your tire expense—save repair bills—double your mileage—prevent punctures and completely free you from all fear of tire trouble.

What INTERLOCKS Are.—The INTERLOCK is a complete inner tire (not an inner shoe) which is placed between the outer casing and the inner tube to strengthen the outer casing and protect the tube. It is the only reinforcement which is locked by air pressure to the rim and which becomes an integral part of the tires, and, therefore, cannot heat or chafe. Even if the tire is broken the INTERLOCK will hold.

INTERLOCKS Insure Safety.—You know that the sudden blowing out of a tire may easily ditch any car when going at fair speed—the safety of INTERLOCKS should appeal to you.

Reduce Your Tire Expense.—You can have the tires on your new car equipped with INTERLOCKS if you specify them. INTERLOCKS are the only perfect tire reinforcement. They cost a little more but are cheapest in the long run.

For your present car—ask any dealer or supply house, or write to us for the name of your nearest supply source. INTERLOCKS will make any fairly sound tire more than carry you through the season. They are easily placed and are made in all sizes.

We Want Dealers Everywhere.—Write for Special 30 Day Offer, Booklets, Prices, Records of Road Tests and Testimonials of users.



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The Hotel of Comfort

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"You can walk from there to anywhere"

Our new addition is ready for occupancy.
We now have 360 rooms with 265 baths.
Write us for descriptive folder with typical floor plan and rate card.
Wire for reservation at our expense.



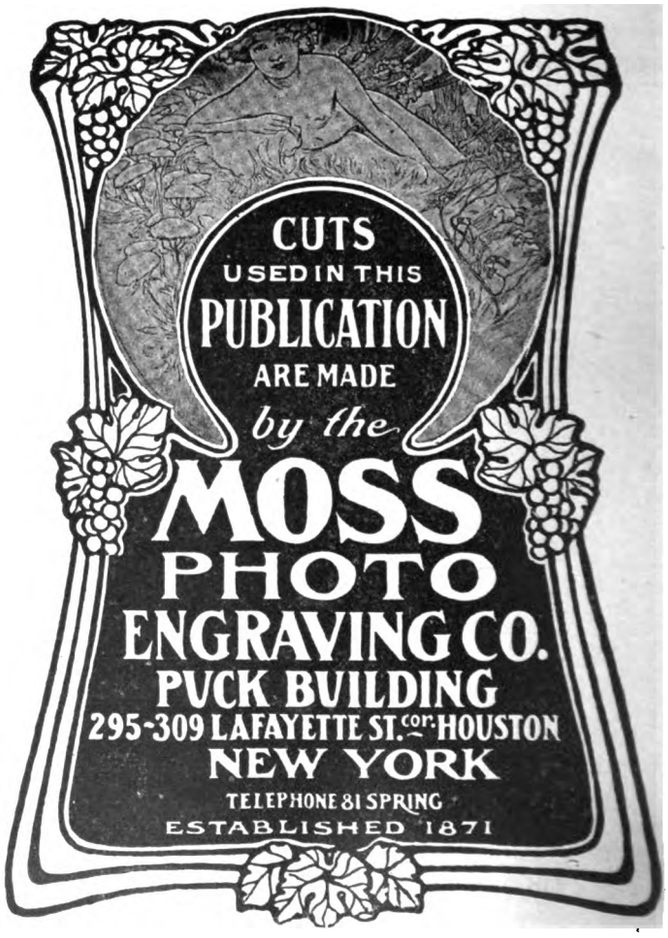
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Court room with bath, for one, per day.....$2.50
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Model K2
Price $75

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THE Warner Auto-Meter is the HIGHEST PRICED speed and mileage indicator made. Despite this more than 100,000 new cars will be Warner equipped in 1913. An inaccurate watch is worthless. A speedometer must be accurate—or nothing. With every 1912 contract renewed, with 100,000 new orders, the Warner Auto-Meter is OFFICIALLY RECOGNIZED.

Prices from $50 to $145. For sale by dealers all over the world and at our own branches.

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ALMOST UNIVERSALLY USED IN FRANCE
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The Ford "J. M.," costing only $35.00, will make your car the equal in riding qualities of a five thousand dollar one.

After September first we will be in a position to equip your car.

Send for our Ford type pamphlet "W."

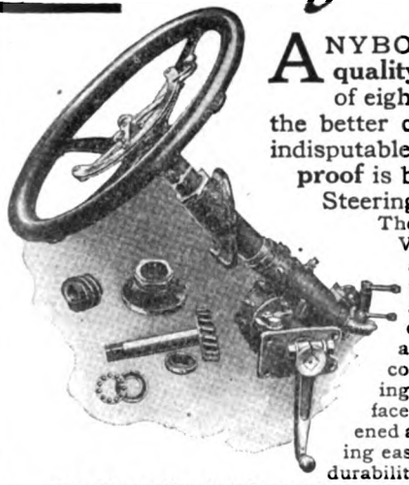
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ANYBODY can claim quality—but a record of eight years use on the better class of cars is indisputable proof. That proof is back of Warner Steering Gears.

The prime features of Warner Gears are: accessibility; complete interchangeability; use of eccentric sleeves; adjustable angle of column; large bearing and contact surfaces specially hardened and ground, assuring ease of motion and durability.

The Warner line includes a wide range in both pleasure and commercial types.

We guarantee dependable deliveries.

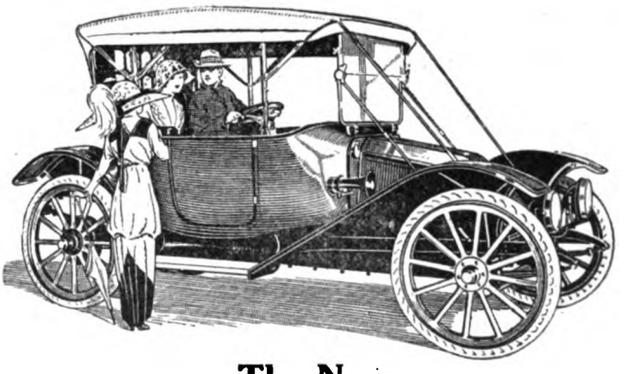
Get acquainted with Warner Quality--make it another selling argument.

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The Argo Roadster is a distinct departure from the old type of awkward, top-heavy electric. It has a long wheel base—low-hung construction—Interlocking foot control—non-reversible wheel steering apparatus—large artillery wheels—bevel gear drive and many other new improvements.

It has all the speed and all the mileage that you are ever likely to need combined with the safety and convenience of an electric. Noiseless—clean--safe and economical to maintain.

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Your tire maker is very anxious to impress upon you the importance of

Tires Inflated to the Right Pressure

He insists that this is tire economy and

Saves You Money

How do you know what pressure you have in your tires? A

SCHRADER
UNIVERSAL
Tire Pressure Gauge

(Trade Mark Registered in U. S. Patent Office)



(Patented March, 1898—Other Patents Pending)

will tell the exact pressure in your tires at any time, day or night, by simply holding this Gauge to your Valve for a second. Its recording sleeve remains in place, showing the exact pressure in the tire so that the Gauge can be taken anywhere and read, at night to the front of the car into the light of the lamps. After the pressure has been ascertained the Indicating Sleeve can be pushed back into the Gauge with your finger. No catches or snaps to operate or get out of order. This Gauge is 2½ inches long over all, short enough to apply easily to the smallest diameter of wheel and can easily be carried in the vest pocket or the change pocket of your trousers.

Price $1.00 Each
Ready for Delivery Now

Guaranteed Simple and Absolutely Accurate

Can be obtained from all tire manufacturers and the dealers, or

A. SCHRADER'S SON, Inc.
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Self HANNA Starter

If you check us up by asking users of our product you will find that the Hanna Self Starter has lived up to its reputation by being 100% efficient.

The self starter business has gotten down to a sane basis now and the wise dealers will align their forces with the responsible makers. Remember that we were the originators and that we were the first manufacturers to produce a manifold self starter at the right price.

Don't Pay More Than $10 For Any Manifold Starter

That is enough to give everybody a good profit. Remember that when you sell the Valentine Manifold Self Starter and Gas Lighter, you sell your customer not only an engine starter which is the equal of any manifold starter made but you sell him a gas lighter as well.

If you are looking for a more satisfactory starter business, get in touch with us.

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SYRACUSE
NEW YORK

The Valentine MANIFOLD Self Starter and Gas Lighter

Remy Magneto

Exchange Your Old Magneto for a New Remy

IT will cost you practically no more than what you will be forced to pay out for constant repairs on your present ignition system. A new Remy will give your car new life. Here is our exchange proposition:

	List Price	Allowance	Net to You
2-Cylinder Remy Magneto with Coil, complete.....	$46 00	$ 9 20	$36 80
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Allowance made for any make of Magneto.

Remy Electric Company
Anderson, Indiana

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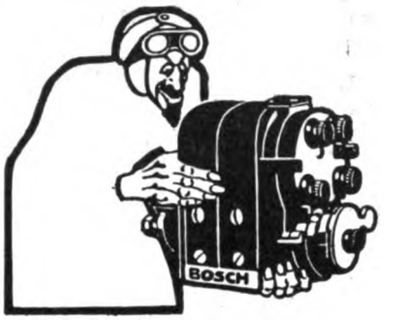
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The "Schafer" ball bearings are the standard of the world. They have been for years at the pinnacle of merit, and remain there because of exceptional workmanship, and the care taken in every step of the manufacture.

The ball bearings are made of especially analyzed, extraordinarily dense crucible cast steel, that combines uniform hardness with toughness from center to surface. All balls show a wonderfully great crushing strength and any ball showing the slightest defect is promptly rejected.

In specifying Schafer Ball Bearings, the manufacturer of the car is assuring the ultimate buyer of one point of quality that goes to make a good automobile still better.

Barthel, Daly & Miller
42 Broadway, New York City



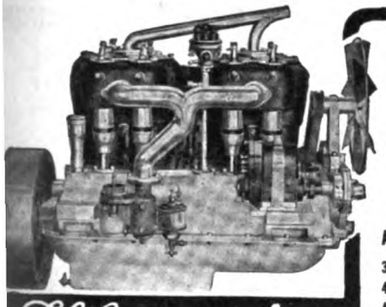
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MAGNETO AND PLUGS

THERE is but one standard of ignition; the value of others is determined according to that standard.

By Bosch All Others Are Judged
Be Satisfied Specify Bosch

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Superior Features

Large Bearings
Perfect Lubrication
Double Ignition
Heavy Crank Shaft
Large Valves
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Perfect Workmanship
Long Stroke

ALL 4 CYCLE — 5 TYPES

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4 3-4 in. bore, 5 1-2 in. stroke, 4 cyl.
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The Consistent Motors

BENZ

Since the introduction of BENZ cars to the motoring public of America no car has attained such world-wide supremacy as to its construction, standing up quality, and material. The new type of 35 and 50 H. P. BENZ models are the last word in automobile construction.

The noticeable features of this type of BENZ cars include the offset crank shaft, smokeless oiler, and SILENT CHAINS instead of timing gears.

The BENZ Carrosseries are noted for their beautiful lines and thorough comfort.

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Our PRICES compete with LEADING AMERICAN makes.

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Safe **Efficient**
Convenient **Economical**

A SPRING starter of Simple Perfection, ABSOLUTELY AUTOMATIC action and FULLY GUARANTEED.

Live Agents Wanted.

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Soot and Carbon CAN'T collect on Reliance Spark Plugs, and impair their efficiency. The patented electrical action of the Reliance prevents it. Soot and carbon are destroyed before being deposited.

If you drive an automobile you want Reliance Plugs. If you build automobiles equip them with Reliance plugs and please the purchasers. You can't furnish better plugs.

JEFFERY-DEWITT CO.

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Largest Exclusive Spark Plug Manufacturers in the World.

Any Kind Every Kind Stock, or to Blue Print **Rims** Clincher Q. D. Demountable Channels

For Automobiles, Motor Trucks, Aeroplanes, Motorcycles, Bicycles.

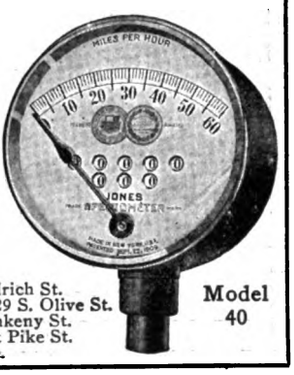
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JONES QUALITY Speedometer

For Motorists Who Demand the Best.



Model 40

THE JONES SPEEDOMETER

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$30.00 for a $105.00 6 cylinder
$20.00 for a $93.00 4 cylinder
$18.00 for a $65.00 2 cylinder
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Imported U. & H. High Tension Magnetos Less Than Import Cost

Circular and Price Lists Free

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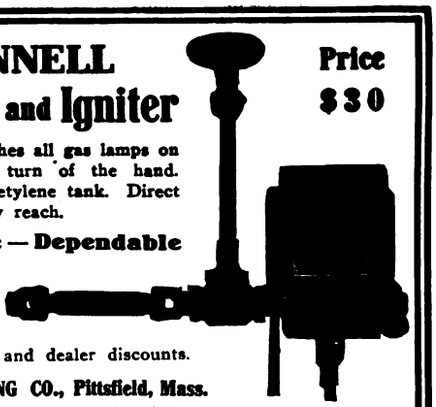
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Price $30

Lights, dims and extinguishes all gas lamps on the car through a simple turn of the hand. Coupled to valve-stem of acetylene tank. Direct control. Always within easy reach.

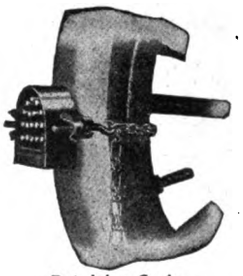
Convenient—Safe—Dependable

Every car owner in your vicinity, Mr. Dealer, will be interested—it's up to you to show them—and sell them. Write for booklet and dealer discounts.

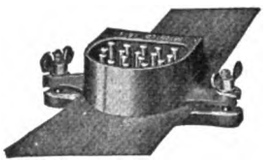


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Sole Licensed Manufacturers for the United States



Repairing Casing



TIRE CUTS ruin casings. They admit moisture to the carcass, cause the fabric to rot and weaken, grow larger—end in blowouts.

You can repair CASINGS and INNER TUBES anywhere in 15 minutes, better than a Repair Shop can do—and for *one cent.*

Universal Auto-Vulcanizer

Patented

A practical vulcanizing outfit complete, with enough repair gum to make 40 patches. It weighs 3 pounds and can be carried in the tool box. Simplest and most satisfactory device for eliminating tire troubles that has ever been devised.

Absolutely automatic. Place the patch—attach the Vulcanizer—put in the gasoline—light it. No further attention required. In 15 minutes the job is done.

It *can't burn, scorch* or *injure* tube or casing. It *can't* get out of order. It *can't* fail to do its work. So simple, anyone can operate it. The Universal Auto-Vulcanizer saves its cost a *hundred times* over in trouble and expense.

Price Complete, $4.00 Ready for Instant Use

Guaranteed Satisfactory or Money Refunded

ADAMSON MFG. COMPANY, East Palestine, Ohio

AUTOMOBILE OWNERS AND TOURISTS

should break their journey and avail themselves of the excellent facilities afforded by the D. & C. Lake Lines, operating daily service between Detroit and Buffalo and Detroit and Cleveland.

Enjoy the delights of the cool breezes from Lake Erie and resume your journey in the morning after a refreshing night's rest. Special attention given by this Company to the handling of automobiles. Rates quoted on application (state wheel base); Tanks of Automobiles must be emptied of gasoline before being shipped; three gallons of gasoline supplied free on arrival at destination.

Roads in this section of the country are in first class condition; new road now under construction between Detroit and Toledo. Tourists speak highly of the route between Buffalo and New York.

On your trip this summer bear in mind "The Waterway is The Only Way."

DETROIT & CLEVELAND NAVIGATION CO.,
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Standard Universal Rims



fit any style or make of tires. The side rings are reversible, they curve outward on one side to fit a straight side tire, inward on the other to accommodate a clincher. Two turns of a nut unlocks the rim for demounting, two more turns locks the rim in place. Write for catalog 607, which explains fully.

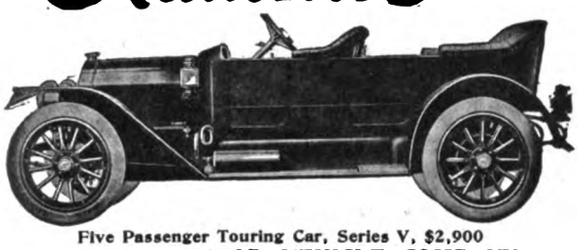


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National 40



Five Passenger Touring Car, Series V, $2,900

NATIONAL MOTOR VEHICLE COMPANY

)7 E. 22nd Street Indianapolis, Ind.

R-C-H "Twenty-Five"

We are determined to build the best all-'round five-passenger touring car in the world and sell it, completely equipped, for

$900.00

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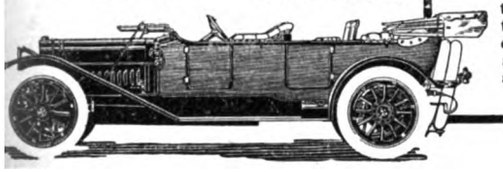
Every part built in the KisselKar plant, which is equipped with every facility for economical manufacture. All KisselKars have extra liberal wheelbase and roomy tonneaus unsurpassed by any car at any price for comfort and capabilities. Write for catalog.

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159 Kissel Avenue Hartford, Wis.

"Thirty"
"Forty"
"Fifty"
60H.P."Six"

KisselKar prices include full equipment—self-starter, top, windshield, demountable rims, speedometer, electric lighting equipment, shock absorbers, etc.



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Electrically Self-Started and Lighted

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Six Models 40 and 50 H. P. Fully Equipped

Model 40—5 Passenger, Fore Door Touring Car.

Model 41—4 Passenger Demi Tonneau.

Model 42—Roadster type—all with the splendid new en bloc motor, 4½ inch bore, 5½ inch stroke. 40 H.P..... $2400

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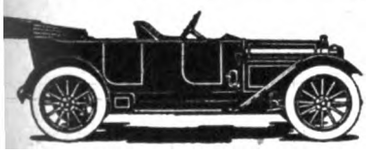
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All fully described in our Art Catalog. Send for one today.

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40-Horsepower Touring Car or Roadster, absolutely silent in operation. Cylinders 4¼ x 5¼-in.—116-in. wheelbase—34 x 4-in. tires—demountable rims—nickel mountings—massive, straight line body—big, roomy seats—proved self-starter—everything. Price $1500. Guaranteed for life by the Michigan Buggy Company. 40-horsepower Roadster on the same chassis. Two smaller models. Catalog on request. (83)

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$3,000,000 in plants affording the most superior facilities for fine work; also hardening and treating of the finished product. Most thorough inspection and testing system. Our own laboratory.

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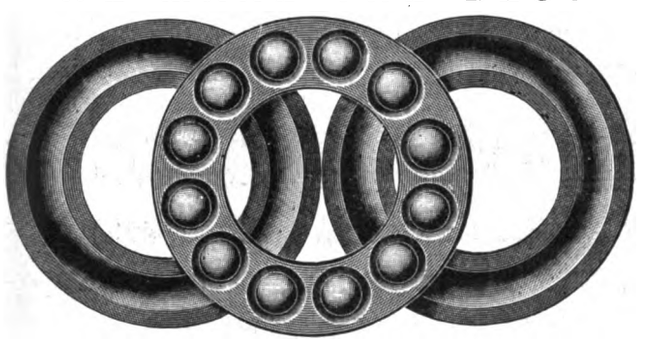
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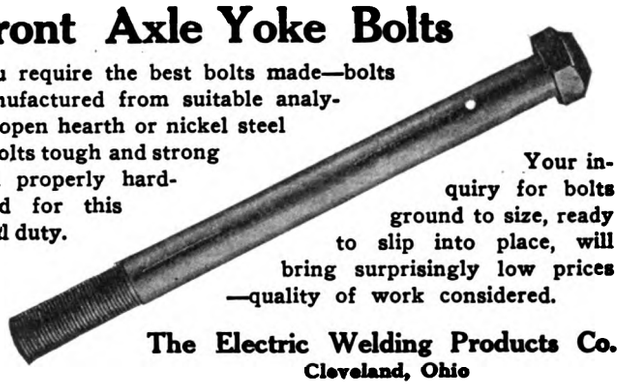
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We could build them cheaper
But We Won't.
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THE DIAMOND RUBBER CO.
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Motorists who use Republic Staggard Tread Tires will tell you that they—

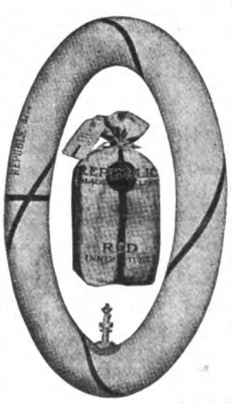
Prevent skidding, make quick starts and short stops easy.

Give double mileage because of the full-thickness tread under the studs.

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We guarantee the Republic Black-Line Red Inner Tube to be as nearly perfect as a tube can be made—and is a fitting companion for the splendid Republic Staggard Tread.

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Duplex brakes produce maximum safety. They are America's leading brakes. Made by brake experts. Nothing so necessary as "quick acting" brakes.

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cost very little more than castings. They are vastly superior and less expensive in the end.

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Series Eight comes in Three Chassis:

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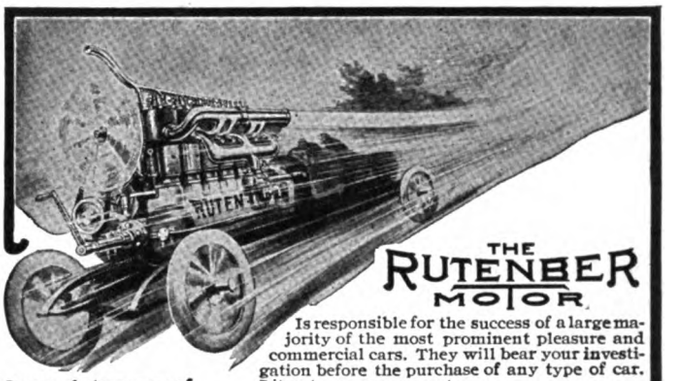
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Factories: York, Pa., Richmond, Va.



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HAVERS SIX — HAVERS MOTOR CAR CO.

Havers Self-Starting "Six-44"



Price $1850

SPECIFICATIONS TALK—Six-cylinder Motor, 4-cycle long-stroke type; 44 H. P.; Bosch Magneto; dual system; Model "C" Stromberg Carburetor. 122-inch wheel-base; 36x4-inch wheels; self starter. Springs, semi-elliptic front, platform suspension, rear; rear axle, full floating type.

Full specifications sent on request.

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THE ULTIMATE CAR
(KNIGHT TYPE MOTOR)

The first American Car to adopt the Silent Knight Motor—the engine used by Daimler, Mercedes, Panhard and Minerva.

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1913 Models Now Ready

"Majestic" 45 Horsepower 4 Cylinders **$1850** **"Olympic"** 35 Horsepower 4 Cylinders **$1500**

Our advance literature fully describes the "Olympic" and "Majestic." Write for it.

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A Car with those Qualities that really count

THE SPEEDWELL MOTOR CAR CO.
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TORPEDO
4-Passenger
$2,700
Fully Equipped
including
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Hupmobile

Long-Stroke "32"
Touring Car
$900 F. O. B. Detroit

Motor 3¼ x 5½ inches; four cylinders; Bosch magneto; three speed sliding gears; tires 32 x 3½ inches; 106 inch wheelbase. Equipment includes windshield, gas headlights, generator, oil lamps, tools and tire repair kit.
Roadster body on same chassis and with same equipment, $900 F. O. B. Detroit.

20 H. P. Models

Runabout—$750
F. O. B. Detroit. Same power plant as World-Touring Car. Wheelbase, 86 inches. Equipment of top, windshield, gas lamps and generator, oil lamps, horn and tools.

Roadster—$850
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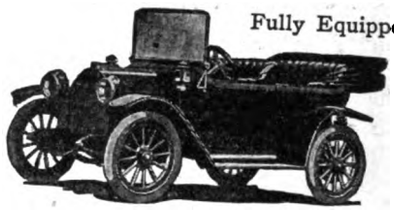
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F. O. B. Detroit. Same power plant as World-Touring Car. Wheelbase, 86 inches. Electric headlights, electric and oil side and tail lamps, folding dash seat for third person. Rear tires, 31 x 3½ inches. With 110 inch wheelbase, $1150.

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The Detroiter—$850

Fully Equipped

Five Passenger Touring Car



25 H. P. Long Stroke Motor

Enclosed Valves, Three Point Suspension, Unit Power Plant, Platform Rear Springs, Full Floating Axle, Left Hand Drive, Center Control, Drop Frame, Large Tires, Complete Ball Bearing Car. Write for specifications.

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Franklin "Little Six"

A 30 Horse Power Six Cylinder Car $2800

A small powered six.

Motor is only thirty horse-power—a big motor is not required in a small car.

In a motor so small, the flexibility and smooth running of six-cylinder construction are very pronounced.

Lubrication is by re-circulating system. One gallon to four hundred miles of running is the average oil consumption. Smoking is entirely done away with.

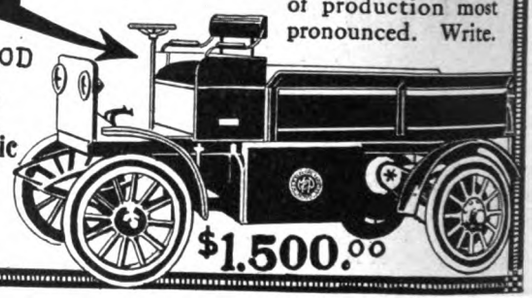
Send for "Little Six" booklet. Catalogue of all models mailed on request.

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DEALERS—Here is the first electric truck that sells for about $700 less than any other. Capacity 1000 pounds—Service 100 per cent. more than gasoline truck—Economy of production most pronounced. Write.

MADE TO MAKE GOOD & DOES IT



M & P Electric Vehicle Co.
Franklin and Dubois Sts.
DETROIT, MICH.

$1,500.00

"Firestone" Tires and Rims



are the least likely to require changing, and afford the best means of tire changing when required.



The Firestone Tire & Rubber Co., Akron, Ohio
and All Principal Cities

K · D

The Motor With the Sliding Crescent Valve

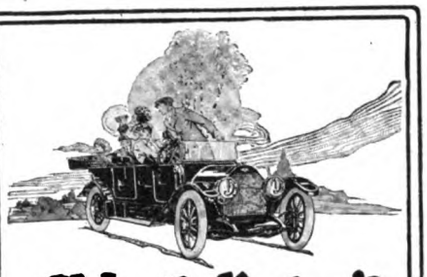
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1896 — 1912

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KNIGHT-DAVIDSON COMPANY, Boston, Mass.

KNIGHT-DAVIDSON

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Abbott-Detroit

"The demand of the day is that an organization shall be judged by its product and not by what it claims for itself" Keep this in mind when you examine these 1913 models

MODELS AND PRICES

30-40	Fore-door Roadster, 116-inch wheel base	$1700
34-40	5-passenger, Fore-Door Touring Car 116-inch wheel base	$1700
44-50	5-passenger, Fore-Door Demi-Tonneau 121-inch wheel base	$1975
44-50	7-passenger, Fore-Door Touring Car 121-inch wheel base	$2000
44-50	Battleship Roadster, 121-inch wheel base	$2150
44-50	7-passenger, Fore-Door Limousine 121-inch wheel base	$3050

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POLSON MANUFACTURING COMPANY

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for the very highest grades of brass goods that can be produced at prices that are right.

Folding Auxiliary Seats, Windshields, Bumpers, Wheel Pullers

and the one

Gasoline Engine Starter

that is

POSITIVELY SURE TO START
POSITIVELY SAFE TO START

Cutting

1913 IMPORTANT FEATURES

Self Starter — Electric Lighting
Turkish Cushions — 36-in. x 4-in. Tires
12-in. Upholstering — Increased Wheel Base
Great Ease of Riding — Carburetor Dash Adjustment
Demountable Rims — Nickel Trimmings

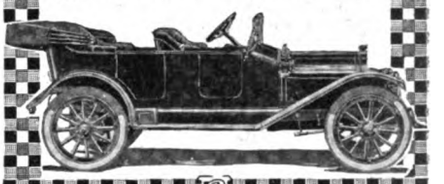
Cutting B-40, 120-in. wheelbase, 40 h. p. 5-passenger touring car, fully equipped, $1475

Cutting A-40, 120-in. wheelbase, 40 h.p. 2-passenger roadster, fully equipped, $1475

Cutting C-55, 132-in. wheelbase, 55 h. p. 5-passenger touring car, fully equipped, $2000

CLARKE-CARTER AUTOMOBILE CO.

305 Mechanic Street Jackson, Michigan



Aluminum Bodies

THE SPRINGFIELD TOP

(Pat. 1895)

SPRINGFIELD METAL BODY CO.

366 Birnie Avenue, Springfield, Mass.

Send Us Your Inquiries When in the Market for

Sheet Metal Stampings

Estimates Cheerfully Furnished

The Bossert Company

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THE ATWATER-KENT IGNITION SYSTEM

ideal for your motor, write for information-booklet D

ATWATER-KENT MFG. WORKS

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$495.00 METZ 22 H. P. MOTOR CAR

The most economical car you can buy at any price. The Metz will run from 28 to 32 miles on a gallon of gasoline, over 100 miles on a pint of lubricating oil, and from 8,000 to 10,000 miles on a set of tires. You can secure exclusive sale of these cars in your territory. Book "B" mailed free on request.

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Only.

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Class A for Electric Lighting
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Manufactured by

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MOTZ Cushion Tires

For Pleasure Cars and Light Delivery Cars

Send for Booklet 58

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B—Shows undercut sides.
C—Shows slantwise bridges.
D—Shows absorbing means when passing over an obstruction.

GOODYEAR

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The Goodyear Tire & Rubber Co., Akron, Ohio

Reo the Fifth

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(98) R. M. OWEN & CO., General Sales Agents

REO MOTOR CAR CO., Lansing, Mich.

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A trouble saver for the motorcyclist

This book contains more practical advice for the rider, more good hard sense, more suggestions as to how to keep out of trouble, and how to get out of it, than has ever been printed heretofore in any one book.

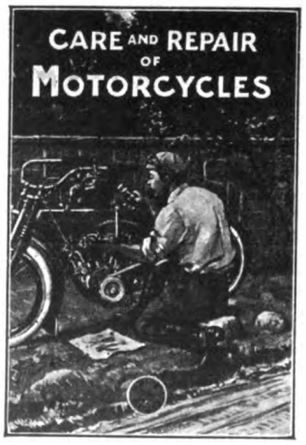
It fits the coat pocket and it includes free engine clutches, two-speed gears, mechanical lubricators and magnetos, together with special matter on motors, valves, carbureters, fuel and important general subjects, all plentifully illustrated.

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The Great Anti-Skid DEVICE

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Either you skid into the "other fellow" or the "other fellow" skids into you.

No matter how careful a driver you may be, you cannot prevent skidding or slipping on wet, muddy snow-covered roads or on icy, slippery greasy pavements unless you equip your car with Weed Chains.

Cannot Injure Tires

Because They Creep

An absolute necessity on both rear wheels and if you want to know what real steering steadiness means put them on the front wheels too.

For your own safety—for the safety of the public, fully equip your car with Weed Chains. Make it your business to get a set today.

The Name "Weed" on Every Hook

Recommended and sold by all reputable dealers

Weed Chain Tire Grip Co.
28 Moore St. New York

Standard Bearings are Enemies of Friction.
Why Don't You "Standardize"?
Standard Roller Bearing Company
PHILADELPHIA

INVADER OIL
"The Best the World Affords"
CHAS. F. KELLOM & CO.
Philadelphia Boston

75% Increase in Tire Efficiency
That's what the INNERSHU accomplishes. It's a tough, durable, rubberized fabric formed permanently to tire shape. Ask for circular.
INNER SHOE TIRE COMPANY
Front Street Grand Rapids, Mich.

Auto-Top Fabrics
OF EVERY DESCRIPTION
SAMPLES AND PRICES ON REQUEST
L. J. MUTTY CO., Boston

AJAX TIRES
Guaranteed 5000 Miles
Ajax-Grieb Rubber Company
General Offices: 1796 Broadway, New York City
Factories: Trenton, N. J. Branches Principal Cities

The National-Acme Mfg. Co.
Automatic Screw Machinery and Their Products.
CLEVELAND (Sixth City)
New York, 77 White St. Chicago, 23 So. Jefferson St.
Detroit, 1222 Majestic Bldg. Boston, 141 Milk St.
Atlanta, 3rd National Bank Bldg. Montreal

Locomobile Cars for 1912
Complete information furnished on request.
The Locomobile Company
BRIDGEPORT, CONN.

THE MOTOR CAR EQUIPMENT CO.
The Only Exclusive Wholesale Automobile Supply House
Write for Our Complete Catalog and Revised Discount Sheet
55 Warren Street New York
Uptown Branch, 238-240 West 58th Street

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These Tires for You

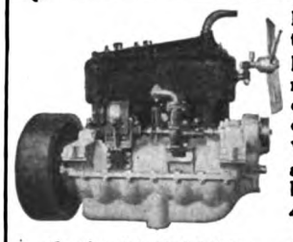
Four corps of experts working in four of the best equipped tire plants in the world are operating as a unit to produce.

UNITED STATES TIRES

Nothing of the kind has ever before been attempted in automobile tire manufacturing.

United States Tire Company
New York

"CONTINENTAL"



Best known motor in America. Look for the name "Continental" on the crank case. We have looked after the quality behind it.

4 and 6 Cylinders
20 to 60 H. P.

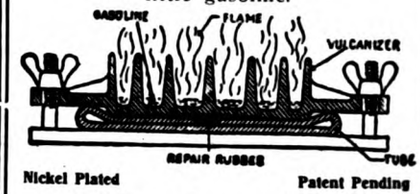
Continental Model "C" *Write for Booklets*

CONTINENTAL MOTOR MFG. COMPANY
Muskegon, Mich.

FACTORY REPRESENTATIVES;
K. F. Peterson, . 122 S. Michigan Blvd., Chicago
L. D. Bolton, ... 1810 Ford Bldg., Detroit

Repairs the Inner Tube in 15 Minutes

Always ready—all you need is some specially prepared rubber and a little gasoline.



Nickel Plated Patent Pending

The Imperial Vulcanizer Repair Kit

Portable—Weighs 3 Pounds
Simple—Easy—Sure

Price $3.50

At your dealer's, or sent by express.

Complete with enough specially prepared rubber for 40 punctures.

Address Dept. E.

McGRAW TIRE & RUBBER COMPANY
East Palestine, Ohio

Mosler Spit Fire Plugs ARE THE BEST
A. R. MOSLER & CO.
P. O. BOX "M"
MT. VERNON, N.Y.

Perfection Spring Company
SPECIALISTS IN
Spring Suspension
High Grade Only
Cleveland, Ohio

Woodworth Treads

will help you to increase your business while benefiting your customers. We will send any responsible dealer a pair on 30 days' trial Write now. Good Agents wanted for unoccupied territory.
LEATHER TIRE GOODS CO., Niagara Falls, N. Y.



GUARANTEED AUTOMOBILE SPRINGS

Our plant is devoted exclusively to the manufacture of high quality springs. All work is oil tempered and warranted. Our circulars contain valuable information. Write.

PENN SPRING WORKS
BALDWINSVILLE, N. Y.



GRANT - LEES GEARS

The Grant-Lees Machine Co.
Cleveland, Ohio

The Bush Radiator
THE BUSH MANUFACTURING CO.
HARTFORD, CONN.



STOP PAYING GARAGE RENT
Why Not Own Your Own Garage?

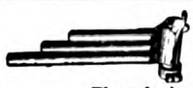
We are Manufacturers and Builders of Fireproof Steel Garages of all sizes. Write for Catalogue and prices.

THE FIREPROOF GARAGE COMPANY
1226 Ridge Avenue Philadelphia, Pa.

The Ford Water Circulator

forces the water from radiator through cylinder water jacket, maintaining rapid circulation when car is in motion. Write for descriptive matter if you handle Ford cars.

THE FULTON-McCUTCHAN CO.
1146 Michigan Ave. CHICAGO, ILL.



MINERVA AUTO HORN
Powerful—Musical

They don't sell on sight, but
They do sell on sound.
Write for prices and circular.
THE MINERVA HARDWARE MFG. CO.
Minerva, Ohio



Tones down headlights for city driving and foggy nights an auto necessity. Price 75c. per pair. Sell like hot cakes. Dealers, secure the agency quick.

F. H. TOBIAS
1931 Broadway, New York

"American Made for the American Trade"

New Departure Guaranteed Ball Bearings

are in 60% of the 1912 cars. Contracts for 1912 cover 80% of the entire output of American automobile manufacturers next year. Reason—New Departure Ball Bearings have "made good." Have you had our 1912 catalog?

THE NEW DEPARTURE MANUFACTURING COMPANY, Bristol, Conn.
Western Branch: 1016-17 Ford Building, Detroit

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For Sale—Wants—Exchange

15 cents per line of six words, cash with order.
— In capitals, 25 cents per line —

A market place where Dealers, Jobbers and Manufacturers may buy, sell or trade used cars, parts and appliances and where help or situations may be secured at a nominal cost.

TO those looking for a really good up-to-date, slightly used car, we have a few recently reconstructed and finished in gray, blue, brown and wine colors, 1910 and 1911 models; Cadillacs, Pullman, Pope-Hartford, Reo, Buicks; can scarcely be told from new; to close out before inventory at very low prices; your chance; no trash in hand. MEYER MOTOR CAR CO., 322 Ellicott St., Buffalo, N. Y.

WILL GIVE my personal mortgage on improved real estate for a 1911 or 1912 auto in good shape and worth prices asked; must be a reliable make. C. A. SACKETT, 21 Broad St., Milford, Conn.

FOR SALE—Two brand new Rider-Lewis touring cars, 1911 model, fully equipped, have never been run. Will sell at a sacrifice if sold at once. M. E. LE SOURD AUTO AGENCY, Bellefontaine, Ohio.

WANTED—First class electric automobile machinist and repairmen in Denver, Colo. P. O. BOX 1023.

AUTOMOBILISTS — Buy guaranteed tools and inner tube puncture-repairing material. Do your own repairing easily and quickly. Agent's price, $5.00; ours, $3.50, cash with order. Bank references. W. H. MIZELLE, Robersonville, N. C.

THE STEVENS-DURYEA COMPANY HAS ERECTED AND EQUIPPED A MODERN AND UP-TO-DATE FACTORY FOR MANUFACTURING THEIR OWN BODIES AND IS NOW READY TO RECEIVE APPLICATIONS FROM FIRST-CLASS WORKMEN IN THE SEVERAL BRANCHES OF BODY BUILDING: BODY MAKERS, SHEET METAL WORKERS, PAINTERS, UPHOLSTERERS, ASSEMBLERS, ETC. ADDRESS: SUPERINTENDENT, STEVENS-DURYEA COMPANY, EAST SPRINGFIELD WORKS, SPRINGFIELD, MASS.

FOR SALE—Locomobile, 1911 model; horsepower, 30.6; maker, Locomobile Co. In good order. Not been used this year. Cost $5,000.00. Highest offer gets it. In perfect running order. Address M. W. ADAMS, Chatham, N. J., where car can be seen.

PEERLESS AUTO TOP DRESSING
Waterproofs mohair and duck automobile tops and curtains. Makes faded and stained tops look like new. Leaves the cloth soft and pliable. Dries over night.
The Columbus Varnish Co., Columbus, O.

FOR SALE—Dealer in new and second-hand automobiles; Ford runabout, 4 cyl., 26 H.P., top, windshield, rumble seat. Maxwell runabout. Oldsmobile, 4 cyl., top, 5-passenger, and windshield. Rambler, 2 cyl., top, 5-passenger, and delivery body, all in good condition. F. B. ARDRIE, 21 Carnes St., W. Lynn, Mass. P. S.—Wanted—to buy 50 automobiles.

LIST FORD OWNERS for U. S. and other makes of cars. Complete lists, 5,000 names, $2.50. OWNERS AUTO LIST COMPANY, Albany, N. Y.

PEERLESS BACK AND CUSHION DRESSING.
A renovator for leather seats and cushions. Brightens the finish, softens the leather and does not crack or peel. Dries in 20 minutes. The Columbus Varnish Co., Columbus, O.

STEAM Vulcanizing Plant—Complete, worth $200; only $25. 3528 N. 27th St., Omaha, Neb.

MAILING LISTS—750,000 auto owners. S. H. CARROLL, JR., Albany, N. Y.

DRAUGHTSMEN WANTED — Prominent Cleveland automobile manufacturer needs competent draughtsmen to work in Engineering Department in laying out new models. Apply in writing. BOX 213, care of Motor World.

PEERLESS EXTRA FINE BLACK BAKING JAPAN.
Bakes to either a high gloss finish, egg-shell gloss or dull finish, on lamps, radiators and fenders. Will not crack, chip or peel.
The Columbus Varnish Co., Columbus, O.

AGENTS WANTED — To handle the $1000 G. J. G. "Junior," racy, classy and specially designed chaseabout with 104-inch wheelbase, with a real 26 H.P. motor, Bosch magneto, Dorian remountable rims with 32 x 3½ tires, at a price of $1000, which is a money maker for the sales agent. Write for literature and discounts to G. J. G. MOTOR CAR COMPANY, White Plains, N. Y.



An ad. like this will cost you 90c. for each insertion.

Mr. Dealer:

You will surely find some where among these announcements a buying opportunity—

A straight line to something you want now—

Look them over and see—

* The circulation of The Motor World is a guaranteed one, sworn to by an affidavit, which will be sent in detail to any one upon request.

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For Sale—Wants—Exchange

15 cents per line of six words, cash with order.
— In capitals, 25 cents per line —

A market place where Dealers, Jobbers and Manufacturers may buy, sell or trade used cars, parts and appliances and where help or situations may be secured at a nominal cost.

AUTOMOBILES—A. C. C. A. Prices Talk! Every make. Every model. Hundreds runabouts, racy roadsters, five-seven passenger touring cars. $50 up. Guaranteed five years. Shipped Freight Prepaid! Write today for the largest Illustrated Catalog published! THE AUTOMOBILE AND CYCLE COMPANY OF AMERICA, Dept. I-N, 1769-1787 Broadway, New York City.

PEERLESS LINING DYE.
Makes a new lining out of a dirty, faded and stained inside. Will not fade or wash off. Leaves the cloth soft and pliable.
The Columbus Varnish Co., Columbus, O.

FORD OWNERS—GET OUR CATALOG. AUTO PARTS CO., PROVIDENCE, R. I.

ONE 35 H.P. Parry Runabout, complete with top, $650. H. KASKEL, Spencerville, Ohio.

TO RESPONSIBLE parties only—Packard 18 touring car or limousine, will rent monthly or winter season with driver; reasonable. For full particulars write only to S. S. ZULA, 322 Columbus Ave., New York.

PEERLESS EXTRA FINE BLACK JAPAN.
Enamels lamps, radiators and fenders to a fine gloss finish. Will not crack, chip or peel. Not affected by heat, retains its lustre.
The Columbus Varnish Co., Columbus, O.

AUTOMOBILE Cylinders Reground, new pistons and rings fitted. Garage air compressors. CAST IRON BRAZING CO., Manchester, N. H.

FOR SALE OR TRADE—One Autocar, 2-passenger, new tires, fine shape. Price $205, worth $350. Will take a good Ford car or Overland for it. Also a Thomas 4-40, fine shape. Want $650. Will trade for good light car, Ford or any good light car. No junk goes. What have you? D. L. MAGEE, Midway, Ind.

PEERLESS LEATHER TOP DRESSING
Makes leather, rubber and pantasote tops and curtains look like new. A safe, durable renovator that leaves the cloth soft and pliable.
The Columbus Varnish Co., Columbus, O.

AUTOMOBILE AGENTS—I want local agents in every county in the United States to handle a popular-priced line of automobiles; a good name and reputation for integrity counts more with us than money or experience; if you have $300 and can furnish bond you can procure the agency for our high-grade car and we will furnish you with demonstrator. For full particulars address R. C. LEWIS, Sales Manager, Box 55, Milwaukee, Wis.

SALESMEN, one who is now visiting automobile trade or owners. Good money made on a very attractive proposition. STURDY MFG. CO., 2637 Michigan Ave., Chicago, Ill.

BROKEN CRANKSHAFTS, cylinders, crankcases, flywheels, gear teeth, pistons, perfectly welded and machined ready to replace. Guaranteed and references. Machinery up to 5 tons welded. ATLAS WELDING WORKS, 74-76-78 Irving St., Rahway, N. J.

WANTED—An experienced automobile body department manager for one of the best electric automobile companies in America. Only those with exceptional ability and experience need apply. A producer wanted. Confidential. BOX 214, care Motor World.

ARE YOU in need of any additional help in any department of your business? Are you out of employment or looking for a better connection? Have you second-hand apparatus of any kind or do you want to buy second-hand material? Have you a factory site for sale or do you want to buy one? If so, use the Want and For Sale column of the Motor World. Seven words to the line, fifteen cents a line. Advertisements can be inserted over a number when it is desired and identity of the advertiser will be kept confidential.

Then remember that *8,000 other readers are doing the same thing—

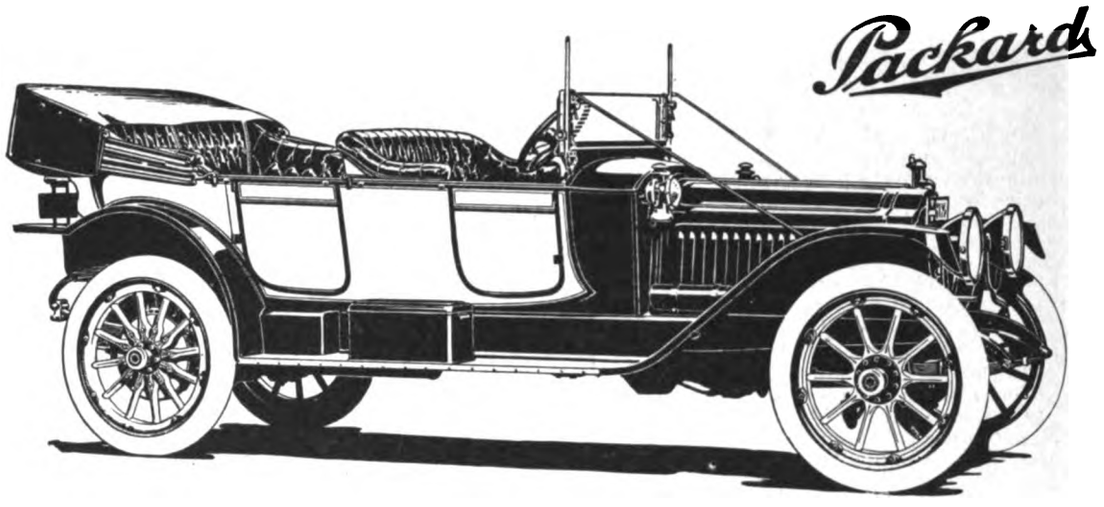
5,000 of them dealers—

All of them intensely interested in the automobile industry. This means a live selling opportunity that costs mighty little.



An ad. like this will cost you $1.05 for each insertion.

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A Smaller Six Cylinder Packard
The New "38"

Left drive and control. Electric self starter; electric lighting. Starting, ignition, lighting and carburetor controls on steering column

Horsepower, A. L. A. M. rating.....38
Maximum brake horsepower.....60
Six cylinders: bore, four inches; stroke, five and one-half inches. All valves enclosed. Wheelbase: Touring Car, 134 inches; Phaeton, 138 inches; Runabout, 115½ inches. Tires: 36 by 4½ inches, front and rear. Three-quarter scroll elliptic springs.

The Packard "38" Line

Touring Car, five passengers	$4150	Imperial Limousine	$5400
Phaeton, five passengers	4150	Brougham	5200
Runabout	4050	Coupe	4500
Limousine	5200	Imperial Coupe	4900
Landaulet	5300	A limited number of four-passenger Phaetons	4150

In road efficiency, ease of riding and luxurious appointment, the new "38" typifies Packard quality

DEMONSTRATION BY PACKARD DEALERS ON ANY KIND OF ROAD. CATALOG ON REQUEST

Packard Motor Car Company, Detroit, Michigan

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KLAXON

MORE THAN "CHEAP"

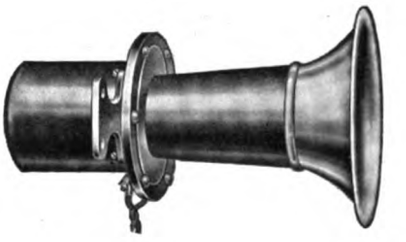
THE KLAXET is more than an efficient motor-driven warning signal at a low-price.

It is a thing of beauty. Its lines are good. Its whole appearance is smart. It has character, distinctiveness. It looks like—and is—a real warning signal; not a carelessly constructed makeshift.

The Klaxet is the cheapest high-grade signal on the market; yet it has been just as thoughtfully designed and carefully made as if it were to cost twice its price.

Behind each Klaxet is the well-known Klaxon guarantee — of permanent satisfaction; and the record of the successful performance of more than ninety-five thousand Klaxons.

To the man who asks what signal you have and you say "Klaxet —the new signal by the makers of the Klaxon:" no further explanation is necessary — no apology. He knows at once that it is the best of its kind in the world.



KLAXET

SLIGHTLY smaller than the Klaxonet, but operates on the same principle: a steel diaphragm vibrated by a motor-driven ratchet wheel.

Finished in brass; nickel; black enamel; black enamel and brass; black enamel and nickel. Complete with wire and push-button . . . . .

$12



KLAXONET

Lovell-McConnell Mfg Company Newark, N.J., U.S.A.

KLAXON

"The Public Safety Signal"



KLAXON

KLAXONET

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Studebaker

When Maker, Dealer and Owner "Get Together"

You, Mr. Dealer, know well—just as well as manufacturers know—that your interests and our interests and the owner's interests are all centered in the car that is made, and sold and owned.

It is right here that maker, seller and owner "get together."

The owner holds you, and he holds us, responsible. Your reputation and our reputation are both at stake. They can't be separated.

We need your energy and responsibility. You need ours.

The Studebaker Corporation, with sixty successful business years behind it, brings to you and to the owner the confidence inspired by this record.

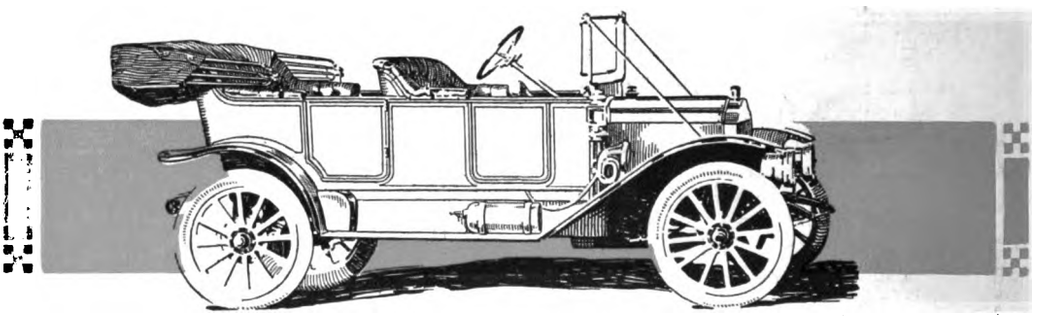
The great size and the mechanical efficiency of our organization bring to you a guarantee of resources, an assurance that we can make good cars and that we can "make good" on every claim we put forward for those cars.

We deliver to you a car made entirely by us. This means not only our responsibility for the perfection of every part, but our ability, through 36 factory branches to make your service more profitable and satisfactory to you and to the owner.

Our co-operation with you is not only a choice—it is a necessity. We are making it as complete as possible because we believe the "get together" should apply after the sale of a car as well as before.

We give you the co-operation of experts and of a business system that recognizes your personal importance in every step toward a still larger success.

We give you the immensely important co-operation of big advertising in magazines, national weeklies, influential newspapers and in your own town newspapers near to your possible buyers. We don't do this spasmodically or in "seasons" but all the year round—so that we are always helping you sell cars.



The $800 Studebaker (Flanders) "20"

Equipped with Top, Windshield, Prest-O-lite Tank and Speedometer, $885 f.o.b. Detroit

STUDEBAKER CARS

(Nickel or Brass Trimmed)

STUDEBAKER (FLANDERS) "20"	
Touring Car	$800
Roadster	750
Utility Car	800
Delivery Car	800

STUDEBAKER (E-M-F) "30"	
Touring Car	$1100
Detachable Demi-Tonneau	1100
Roadster	1100

See our dealer. You can get prompt delivery. Our Art Catalog A-9 is yours for the asking.

The Studebaker Corporation Detroit, Michigan

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THE MOTOR WORLD

A Trade Paper Giving the World's Motor News

Vol. XXXII
No. 11

New York, September 5, 1912

Ten cents a copy
Two dollars a year

GRAY & DAVIS

6 Volt Electric Starter

Has Been Adopted as Standard Equipment on

1913 Peerless Cars

The Peerless Motor Car Co. selected the GRAY & DAVIS Electric Starter after the most exhaustive tests made in zero weather when starting conditions were at their worst.

This Starter is the Greatest Step Forward in the Perfection of the Automobile Since the Introduction of the Gray & Davis Dynamo—Four Years Ago.

The GRAY & DAVIS Electric Starter is absolutely positive in operation. Pressure on a pedal starts the engine. Requires but a 6 volt battery. This is one of the BIG features. No annoyances or expense for charging—the Dynamo does it automatically. Will start an engine that has stopped on "dead center." No complicated controls—only a simple switch. Will spin the heaviest type of "Six" one and a half hours—propel it two miles. If car is stalled this Starter instantly moves car until engine "picks up" without having to throw out clutch, change gears or manipulate throttle.

Write for Particulars

GRAY & DAVIS, Inc., 55 Lansdowne St., Boston, Mass.

Manufacturers of Automobile Lamps, Dynamos and Electric Starters

Published Weekly by The Motor World Publishing Company, 1600 Broadway, New York

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Truffault-Hartford SHOCK ABSORBER

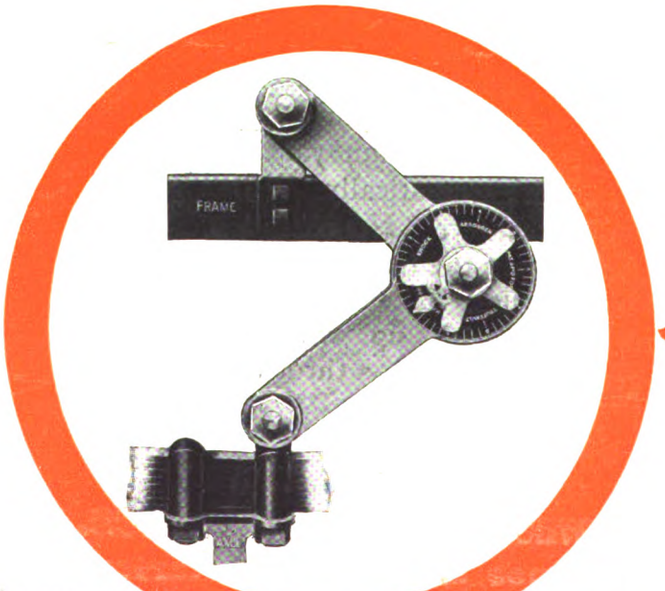
Increased Sales for YOU

—if the car YOU sell is Truffault-Hartford equipped.

Your interests are best served when you can meet the demand of owners for Truffault-Hartford equipment on the cars they buy.

Leading manufacturers—producing 27 popular cars—recognize the insistence of the demand for this necessary device. THEY equip their cars with Truffault-Hartfords—at the factory.

Does the manufacturer you represent recognize this demand? Truffault-Hartford equipment—on any car—enhances its value as a car and as a selling proposition. Insist that your manufacturer includes Truffault-Hartfords on the car you sell. It means increased sales for you.



Hartford Suspension Company

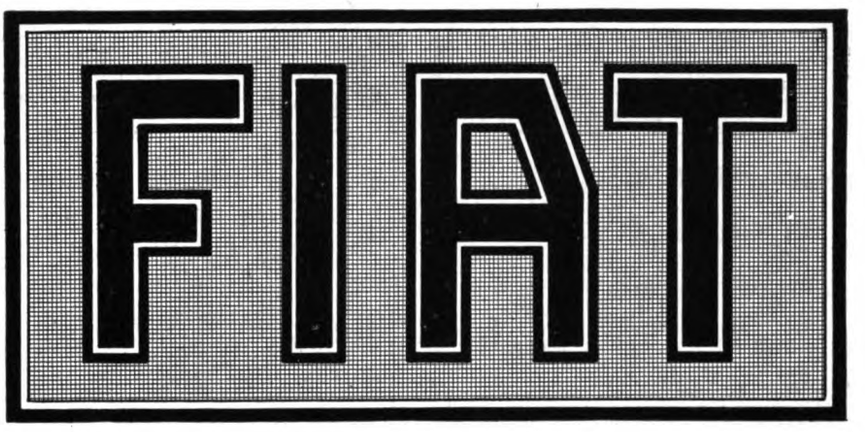
EDW. V. HARTFORD, President

Factory, 164 Bay Street, Jersey City, N. J.

BRANCHES :

NEW YORK—1700 Broadway
NEW YORK—212-214 West 88th St.
JERSEY CITY—141-143 Morgan St.
BOSTON—319-325 Columbus Ave.
CHICAGO—1458 Michigan Ave.
DETROIT—803 Woodward Ave.
KANSAS CITY—1524 Grand Ave.
NEWARK—289 Halsey St.
PHILADELPHIA—1437 Vine St.
ASBURY PARK—Ocean and 3rd Aves.
INDIANAPOLIS, IND.—448-450 N. Capitol Blvd.
BRETTON WOODS, N. H.—Bretton Woods Garage

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Solution of the Selling Problem

F·I·A·T of Poughkeepsie, N. Y., has solved the selling problem for dealers wishing to make permanent business connections on a profitable basis. This solution bears directly on important phases of automobile merchandising. It makes the distribution of **Fiat** cars an unequaled *business* proposition appealing immediately to *business* men.

There is prestige in handling the **Fiat** Line. It is the standard of motor car perfection in all civilized countries. Every successful car has somewhere in its construction one or more features borrowed from a **Fiat** of former years.

The 50 H.P. six-cylinder **Fiat** is a masterpiece of silence, flexibility and reserve power. The 35 H.P. four-cylinder model is a perfect type of moderate power for family use in town or country.

The *new* 55 H.P. four-cylinder car is a wonderful creation—a war-horse for power in any emergency, yet silent, vibrationless and easy-riding, responding to the throttle like the six-cylinder car.

All of these models have the simple, economical, light-weight monobloc type of motor which has revolutionized the industry, and bodies of exquisite design and workmanship in a variety of styles.

A Business Proposition for Live Business Men—Write

Sales Department D

Poughkeepsie **F·I·A·T** **New York**

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Mr. Automobilist:

Your tire maker is very anxious to impress upon you the importance of

Tires Inflated to the Right Pressure

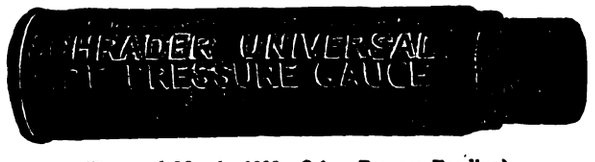
He insists that this is tire economy and

Saves You Money

How do you know what pressure you have in your tires? A

SCHRADER
UNIVERSAL
Tire Pressure Gauge

(Trade Mark Registered in U. S. Patent Office)



(Patented March, 1898—Other Patents Pending)

will tell the exact pressure in your tires at any time, day or night, by simply holding this Gauge to your Valve for a second. Its recording sleeve remains in place, showing the exact pressure in the tire so that the Gauge can be taken anywhere and read, at night to the front of the car into the light of the lamps. After the pressure has been ascertained the Indicating Sleeve can be pushed back into the Gauge with your finger. No catches or snaps to operate or get out of order. This Gauge is 2½ inches long over all, short enough to apply easily to the smallest diameter of wheel and can easily be carried in the vest pocket or the change pocket of your trousers.

Price $1.00 Each
Ready for Delivery Now

Guaranteed Simple and Absolutely Accurate

Can be obtained from all tire manufacturers and the dealers, or

A. SCHRADER'S SON, Inc.
28-32 Rose Street New York City

ADVERTISERS INDEX

A

Abbott Motor Co.....44-45
Adamson Mfg. Co..... 68
Ajax-Grieb Rubber Co..... 76
American Ball Bearing Co..... 68
American Motors Co..... 73
American Starter & Carburetor Mfg. Co,..... 72
Apple Electric Co..... 68
Argo Electric Vehicle Co..... 77
Atwater Kent Mfg. Works..... 31
Automobile Supply Mfg. Co.... 71

B

Badger Brass Mfg. Co..... 72
Bantam Anti-Friction Co..... 71
Barthel, Daly & Miller..... 67
Bartholomew Co..... 69
Benz Auto Import Co..... 66
Bosch Magneto Co..... 67
Bossert Co..... 75
Bretz Co., J. S..... 42
Briggs-Detroiter Co..... 37
Brown-Lipe-Chapin Gear Co... 71
Bush Mfg. Co..... 77

C

Cartercar Co..... 73
Champion Ignition Co..... 70
Champion Spark Plug Co..... 70
Clarke-Carter Automobile Co... 75
Classified Advertising.....78-79
Cole Motor Car Co..... 73
Colonial Electric Car Co..... 72
Consolidated Mfg. Co..... 72
Continental Motor Mfg. Co.... 75
Covert Motor Vehicle Co..... 69

D

Dayton Auto Truck Co..... 72
Dayton Rubber Mfg. Co..... 77
Dean Electric Co..... 32
Detroit & Cleveland Navigation Co. 68
Diamond Chain & Mfg. Co..... 64
Diamond Rubber Co..... 71
Double-Fabric Tire Co..... 74

E

Electric Welding Products Co.. 63
Empire Automobile Co..... 69

F

Federal Rubber Mfg. Co..... 63
F. I. A. T..... 1
Fire Proof Garage Co..... 76
Firestone Tire & Rubber Co.... 71
Ford Motor Co..... 69
Franklin Automobile Co..... 57
Fulton-McCutchan Co..... 77

G

G. C. A. Mfg. Co..... 68
Golde Patent Mfg. Co..... 71
Goodyear Tire & Rubber Co., The 75
Grant-Lees Machine Co..... 77
Gray & Davis.....Front cover
Great Northern Hotel..... 67
Grossman Co., Emil..... 75

H

Hartford Suspension Co., Inside front cover
Havers Motor Car Co..... 73
Haynes Automobile Co..... 72
Hodge & Graves..... 70
Hupp Motor Car Co..... 69
Hyatt Roller Bearing Co..... 70

I

Ideal Motor Car Co..... 40
Inner Shoe Tire Co..... 76
Inter-State Automobile Co..... 33

J

Jeffery-Dewitt Co..... 50
Jencick Motor Corp..... 70
Jones Speedometer..... 68

K

Kellom & Co., Chas. F..... 76
Kelly-Springfield Tire Co..... 76
Kinsey Mfg. Co..... 71
Kissel Motor Car Co..... 74
Kline Motor Car Corp..... 73
Knight-Davidson Co..... 74
Knox Automobile Co.....38-39

L

Lauth-Juergens Motor Car Co.. 66



Digitized by Google

ADVERTISERS INDEX

Leather Tire Goods Co..... 77
Locomobile Co..... 76
Lovell-McConnell Mfg. Co., Inside back cover

M

Marion Motor Car Co..... 52
Mayo Radiator Co..... 3
McCue Co..... 36
McGraw Tire & Rubber Co.... 75
M & P Electric Vehicle Co.... 56
Metz Co..... 62
Michigan Motor Car Co.....46-47
Miller, Chas. E..... 61
Moline Auto Co..... 65
Mosler & Co., A. R..... 77
Moss Photo Engraving Co..... 61
Motor Car Equipment Co..... 76
Mott Wheel Works..... 68
Motz Tire & Rubber Co..... 77
Mutty Co., L. J..... 76

N

National-Acme Mfg. Co..... 76
National Motor Supply Co..... 77
National Motor Vehicle Co.... 69
New Departure Mfg. Co..... 72
New Process Rawhide Co..... 70
Niagara Sales Co..... 75
Nordyke & Marmon Co..... 69
Nyberg Automobile Works..... 77

O

Oakland Motor Car Co..... 74
Otho Motor Co.....34-35
Owen & Co., R. M..... 77

P

Penn Spring Works..... 76
Perfection Spring Co..... 77
Piel Co., J..... 70
Polson Mfg. Co..... 75
Premier Motor Mfg. Co.....58-59
Prest-O-Lite Co..... 75
Pullman Motor Car Co..... 74

R

Rajah Auto Supply Co..... 69
Rayfield Carburetter Co..... 30
R. C. H. Corp..... 74
Reeves Sexto-Auto Co..... 65
Reliance Speedometer Co..... 75
Remy Electric Co..... 66
Republic Rubber Co..... 75
Rhineland Machine Works..... 77
Royal Equipment Co..... 71
Rutenber Motor Co..... 73

S

Sanford Motor Truck Co..... 66
Schrader's Sons, A., Inc..... 2
Shawmut Tire Co..... 72
Sheldon Axle Co..... 80
Sparks-Withington Co..... 75
Speedwell Motor Car Co..... 74
Splitdorf Electrical Co..... 74
Springfield Metal Body Co..... 76
Standard Electric Car Co.....54-55
Standard Roller Bearing Co.... 76
Standard Welding Co..... 41
Standard Wheel Co..... 70
Start - Lite Co..... 57
Stearns Co., F. B..... 73
Stewart Motor Corporation.... 29
Streator Motor Car Co..... 73
Studebaker Corporation. Back cover

T

Timken Roller Bearing Co..... 53
Tobias, F. H..... 76
Twitchell Gauge Co..... 65

U

United Rim Co..... 68
U. S. Motors Co.....48-49
United States Tire Co..... 77

W

Warm Hand Steering Wheel Co. 60
Warner Gear Co..... 67
Warner Instrument Co..... 43
Weed Chain Tire Grip Co..... 76
Whitney Mfg. Co..... 62
Willard Storage Battery Co.... 75
Willys-Overland Co., The..... 4

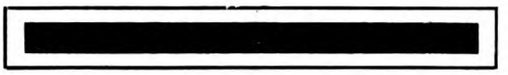


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Mayo Radiator Co.
NEW HAVEN, CONNECTICUT

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Overland 1913

$985

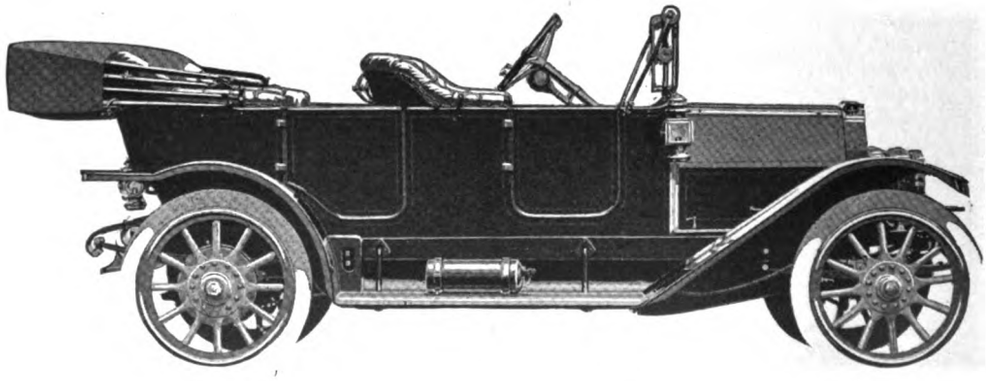
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¶ Automobile satisfaction demands the maximum of efficiency, service and economy. This is what we have incorporated in the Overland Model 69 T at $985. Under other nameplates you must pay $1200 for a car of this description. We could not give it ourselves were we not to make 40,000 cars this year. You benefit through our quantity production. Write us today for 1913 catalogue. Please ask for Book I-49.

The Willys-Overland Company, Toledo, Ohio



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THE MOTOR WORLD

Vol. XXXII New York, U. S. A., Thursday, September 5, 1912. No. 21

GOODYEAR REACHES ACROSS THE SEA

Representative Sails to Form Companies in England, France and Germany—To be Supplied from Canadian Plant.

Marking the beginning of a world-wide campaign on the part of the Goodyear Tire & Rubber Co., of Akron, Ohio, L. C. Van Bever, of Toronto, who is vice-president of the Goodyear Canadian company, will sail to London to-day. In that city he will complete the formation of a British Goodyear company, which will establish a branch in London and organize a complete distributing system throughout Great Britain, in which work Van Bever will lend active assistance. The British company also will control the Goodyear interests in South Africa and other British possessions.

After completing his mission in London, Van Bever will go to France and Germany, in which countries similar companies will be organized under his supervision. Arrangements also are under way that will result in the formation of a Goodyear company in Australia, which will handle the well-known American tire in that part of the world.

Goodyear plans do not contemplate immediate erection of factories abroad, although it is not improbable that in due course one or more may be established. For the present, however, the Goodyear tires and other products which will be handled by the foreign companies will be manufactured by the Canadian plant whence they will be shipped abroad for distribution.

Cameron Completes its Reorganization.

After a considerable period of negotiation, the Cameron Car Co., of Beverly, Mass., which became financially embarrassed early this year, has emerged from its troubles, a reorganization having been effected under the style Cameron Mfg. Co. The officers, who also comprise the directors, are the same as those which served the original company, as follows: E. S. Cameron, president; H. P. Cameron, secretary, and A. B. Emerson, treasurer. In addition to its plant in Beverly, the company also operated a factory in Attica, Ind., both of which will be continued, and a considerably improved line of Cameron cars be produced. While they do not figure as officers or directors, it is known that the capital which made possible the reorganization of the Cameron affairs was supplied by A. H. Bennett, of the Beverly National Bank, and L. B. Sutton, an Attica banker, who, though remaining somewhat in the background, will exercise a controlling influence.

Smith to Add Axles and Bearings.

E. A. Arnold, chief engineer and sales manager of the Metal Products Co., of Detroit, has relinquished that connection and engaged with the A. O. Smith Co., of Milwaukee, as consulting engineer. In his new capacity, Arnold will divide his time between the engineering and the sales departments of the Smith company, which, it is understood, is about to place on the market a new line of axles and bearings, in the development of which Arnold will play large parts.

Terry Becomes Head of Harris Oil.

To fill the vacancy in the A. W. Harris Oil Co., of Providence, R. I., caused by the death of A. W. Harris, its president, Benjamin S. Terry has been elected to that office. Other officers chosen are George F. Heywood, secretary, and Arthur D. Green, treasurer, both of whom, like the new president, were identified with the Harris company previous to the death of its president.

Importers' Show to be Repeated.

Contrary to more or less general opinion, the Importers Salon, which during the last two years has been held in the ballroom of Hotel Astor, New York, will be repeated in 1913. The Astor again will be the scene of the show, which will be held early in January next.

RECEIVERS TAKE CHARGE OF THOMAS

Philadelphia Creditor Forestalls Action of Committee—Assets Exceed Liabilities, and Company May Be Reorganized.

Before the meeting of the creditors' committee, which was fixed for Monday, 2nd inst., could take place, the affairs of the E. R. Thomas Motor Car Co., of Buffalo, were brought to a climax, on Thursday, 29th ult., when it was placed in the hands of receivers. They are George C. Finley, secretary of the H. D. Taylor Co., and Adolph Rebadow, of the law firm Rebadow & Ladd, both of whom stand high in Buffalo business circles and who are considered uncommonly capable men.

The receivership resulted from an action in equity instituted in the Federal court in Buffalo by William & Harvey Rowland, Inc., of Philadelphia, manufacturers of springs, who alleged that, while entirely solvent, the company temporarily is unable to meet extension notes given at the time of reorganization a year ago and who, therefore, prayed for the appointment of receivers as a means of protecting all creditors.

The Thomas liabilities are $960,000 and the assets about $1,700,000. The creditors include several banks, both local and foreign, and a large number of manufacturers identified with the automobile industry. It is probable that Eugene Meyer, Jr., & Co., the New York bankers, are the largest creditors. They invested heavily at the time of reorganization last year, and, in fact, made the reorganization possible, and since have been in control. They also are very heavily interested in the United States Motor Co., which fact several times has given rise to reports that the Thomas company was closely linked with the bigger corporation.

The receivers furnished bond for $50,000 and will continue the business until such time as they believe the claims of the creditors can be satisfied, or until such plans

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are formulated as promise the greatest measure of relief. They have hopes of attracting new capital and effecting a reorganization. The future, however, will depend largely on the temper of the creditors themselves.

For the present, no new cars will be manufactured and the comparatively few mechanics who have been retained are devoting themselves to the making of repairs and the production of replacement parts for Thomas cars.

Frederick R. Humpage, president and general manager, will remain with the company, and, under the direction of the receivers, will manage its affairs. Humpage, together with W. L. Gleason, vice-president, and J. J. Ramsey, secretary and treasurer, tendered their resignations to the board of directors several weeks ago, but that body refused to accept them. Gleason and Ramsey, however, will sever their connections within a few days, but Humpage, as already stated, has consented to remain, at least until further notice. The option which he held on the Thomas property has expired.

The Thomas company was the outgrowth of the bicycle business founded by E. R. Thomas in 1889. When the public began to take more notice of motor cars, however, motorcycles were abandoned and the Thomas company earned handsome profits, and, until about three years ago, enjoyed enviable prosperity. Troubles which then beset it grew in magnitude until last year, when it was saved from going to smash only by the intelligent effort of an uncommonly capable creditors' committee, headed by W. H. Crosby, of the Crosby Co., of Buffalo. It was at that time that the Meyers interests stepped in and obtained control. In doing so, they shouldered a heavy burden in the form of a debt of $600,000, of which all but $250,000 has been paid, not including a personal note for $210,000 held by E. R. Thomas himself, who retired from the company when its reorganization was effected.

Rumor has been free with its affairs during recent months, and failure was averted on August 1st only because the creditors consented to an extension of $120,000 in notes which fell due on that date.

The receivership proved not wholly surprising, as it was known that friction existed among the creditors, and there was every likelihood that had the creditors' committee met on Monday last, according to program, and as exclusively stated in last week's Motor World, a receivership would have been recommended.

Whitney Again to Enlarge its Plant.

Although the Whitney Mfg. Co. only a few months since completed a considerable addition to its plant in Hartford, Conn., contracts for another enlargement have been let. The new building will be a two-story concrete structure, 50 x 180 feet, and will follow the handsome architectural design of the building which now houses the plant.

WILL JOIN CHAMBER OF COMMERCE

N. A. A. M. Decides to Join Big Organization—Two New Members Elected and Several Representations Changed.

It is practically settled that the National Association of Automobile Manufacturers will become a member of the Chamber of Commerce of the United States, which was organized early this year under the auspices of the Federal government itself.

The subject was discussed at the regular monthly meeting of the N. A. A. M. which occurred yesterday, 4th inst., in its New York offices, and it proved the consensus of opinion that the objects of the Chamber of Commerce merited the active support of the automobile trade. When the N. A. A. M. joins the Chamber of Commerce it will be represented by either its president or vice-president.

At yesterday's meeting it also was decided to hold a semi-annual meeting of the general membership some time during October or November. The exact date has not yet been set.

Two applicants were added to the N. A. A. M. roll—the Westcott Motor Car Co., of Richmond, Ind., represented by H. L. Ashly, and the Kline Motor Car Corporation, of York, Pa., represented by J. A. Kline.

The name of the Metzger Motor Car Co. having been changed to the Flanders Motor Co., the Metzger membership in the M. A. A. M. was transferred to the latter. It will continue to be represented by W. E. Metzger, who is serving his second term as president of the national organization. The membership of the Rapid Motor Vehicel Co. also was transferred to the General Motors Truck Co., which will be represented by Gleeson Murphy.

Several changes of members' representatives also were confirmed. E. R. Benson succeeded Frank E. Fisher as representative of the (Studebaker) E-M-F Co., Hanson Robinson succeeded W. R. Innis as representative of the Studebaker Bros. Mfg. Co. and G. G. Lutby succeeded J. B. Bartholomew as representative of the Bartholomew Co.

Those present at the meeting were: W. E. Metzger, A. L. Pope, W. C. Leland, H. O. Smith, H. H. Rice, Alfred Reeves, R. D. Chapin, S. D. Waldon, Charles Clifton, Hugh Chalmers, S. T. Davis, Jr., S. A. Miles, J. S. Marvin, A. L. Prindle.

Fiat Men and Affairs Undergo Changes.

Concurrent with the retirement of J. S. Josephs and Benjamin Eichberg from the Fiat Automobile Co., of 1776 Broadway, New York, to devote their entire time to the development of the Fiat factory in Poughkeepsie, N. Y., the New York Selling company has been taken over by a new corporation, the Fiat Motor Sales Co., organized under the laws of New York with $300,000 capital. The old company was capitalized at $100,000. E. R. Hollander, who, like Josephs and Eichberg, has been identified with the sale of Fiats for many years, is the president of the new Fiat Motor Sales Co., the vice-president of which is Henry M. Sage, of Albany, N. Y. Chas. L. A. Whitney, also of Albany, is treasurer. He is a well-known and successful merchant in that city who, as an extensive personal user of Fiats, later became the Albany agent for the car and, becoming even more enthusiastic, he has invested in the new corporation and will enter the wider selling field which the Metropolis affords. The secretary of the company is R. D. Willard, of New York, who has been connected with the automobile trade for some 12 years, during the last three of which he has been associated with the Fiat Automobile Co.

The new company will control New York, Albany, Boston, Providence and New England territory and will wage a much more vigorous campaign than heretofore, while Josephs and Eichberg, having entered even more intimately into the affairs of the Fiat factory in Poughkeepsie, will greatly increase its output and increase the aggressiveness from that direction.

Cole Fathers an "Intensified Convention."

J. P. Cole, president of the Cole Motor Car Co., of Indianapolis, is leading a movement which is expected to result in the holding of "a mammoth, intensified national sales and advertising automobile convention" in Indianapolis October 8th and 9th. While definite announcement has not yet been made, invitations have been extended to a number of well known systematizers, "business engineers," publicity men and editors, several of whom already have accepted. It is the idea to relieve the strain of the two days of intensified addresses and discussion by a big banquet. It is believed that an attendance of 1,000 or more can be attracted.

Court Designates Receiver for King.

Growing out of the petition in bankruptcy filed on Thursday, 27th ult., by three minor creditors, the Federal court in Detroit has named the Union Trust Co., of that state, as receiver for the King Motor Car Co. Its bond is fixed at $5,000. The business will be conducted by the receiver and, meanwhile, efforts will be continued to bring to a head the reorganization plans which were in hand at the time the bankruptcy petition was filed.

Remnants of Owosso Truck Bring $650.

By order of the court, the stock on hand of the Owosso Motor Co., which endeavored to build trucks in Owosso, Mich., and which went broke in the effort, has been disposed of at public sale. Most of the property consisted of automobile parts, which were bid in by Adolph V. Voge, of Detroit, for $650.

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"STATE OF AFFAIRS" IN STREATOR

Barlow Files Long Complaint Attacking Former Partner—Chubbuck Declares He Seeks to Harrass Company.

What may be described as a "state of affairs" has arisen within the Streator Motor Car Co., of Streator, Ill., maker of the Halladay car, which was reorganized slightly less than a year ago. John C. Barlow, president of the company, who pledged much of his personal property to effect the reorganization, is not wholly happy and is at odds with Paul R. Chubbuck, vice-president and its active manager, who also gave personal belongings as security to the bondholders' committee appointed at the time the bonds were issued and the trust deed was executed by Barlow and Chubbuck.

Barlow's unhappiness has resulted in resort to the courts, apparently to obtain the appointment of a receiver to "conservatively conduct the affairs of the company," as his complaint expresses it. According to Chubbuck, however, Barlow's action is actuated by mere desire to harrass the company and to injure its credit and sales. However that may be, Barlow has instituted suit, naming as defendants not only the Streator Motor Car Co., but the People's Trust & Savings Bank, Western Motor Co. of Indiana, A. O. Smith Co. of Milwaukee, Arthur O. Smith, Frank B. Wilkinson and William J. Zimmers.

The complaint in the case specifies a long list of alleged grievances and rehashes much that was made public at the time the Streator company became embarrassed last year; it also makes plain that Barlow no longer harbors love for his former partner, Chubbuck. Among other things, he alleges mismanagement of the company and asserts that the purpose of the present management is shaped for the benefit of Chubbuck and the bondholders' committee. The charges are very involved and recite, among other things, that the A. O Smith Co. and the Western Motor Co., who promised to extend a line of credit of $75,000, have failed to do so. In addition to the appointment of a receiver, Barlow asks for an injunction restraining the bondholders from collecting on the bonds.

According to Chubbuck, his former partner is not only seeking to embarrass the company but has refused to pay taxes on his property included in the trust deed, has collected rents in advance and otherwise has failed to keep promises made in the trust agreement. As a measure of relief, the Streator company has purchased a plant adjoining the one now occupied, and in order further to harrass its operation it is alleged that Barlow filed three separate suits to prevent the consummation of the sale, all of which were determined against him by the referee.

Meanwhile, the Streator company is vigorously opposing Barlow's application for a receiver and is operating as usual and, apparently, is doing a splendid business.

Newark Truck Strikes Financial Rocks.

After struggling against fate for more than a year, the Newark Automobile Mfg. Co., of 179 Frelinghuysen avenue, Newark, N. J., filed a voluntary petition in bankruptcy on Saturday last, 31st ult. It places its liabilities at $23,500 and its assets at $28,200. The company was incorporated in March, 1911, with $500,000 capital stock and sought to engage in the manufacture of motor trucks. It did not manufacture very many of them, however, and early in its career was harrassed by suits instituted by men who alleged that they had been engaged to promote the sale of the company's shares. On July 23rd last its embarrassment was so acute that the creditors granted a year's extension, but the extension failed of its purpose, the company, as stated, acknowledging the inevitable last week. Its officers are John T. Walsh, president, John W. Phillips, vice-president, and H. V. Radonitz, secretary and treasurer.

Upset Kills Stromberg's Sales Manager.

En route to the scene of the Elgin road races, John R. Ballinger, sales manager of the Stromberg Motor Devices Co., of Chicago, was instantly killed early Friday morning last, 30th ult., when the automobile he was driving turned turtle near Bartlett, Ill., 29 miles from Chicago. The car was the high-powered racer which was used by Ralph Mulford when he won the Vanderbilt Cup race in 1910, and according to the best testimony it was not exceeding 30 miles an hour when one of the front tires exploded at the same moment that the car struck a rut, causing it to overturn, Ballinger being thrown under the wreck and his neck broken. Ballinger's brother, Leon, who accompanied him, was also seriously injured. Ballinger, who was 26 years old, was well known in trade circles and was an uncommonly competent and aggressive young man.

Why Ford Will Make no Announcement.

"The Ford Motor Co. has no car announcement for 1913 to make to the trade," is the word that comes from the Ford factory. "Having long ago abandoned the yearly announcement policy and standardized its production, except in minor details, the Ford model has not been changed for four years, nor will it be changed for 1913. The famous Model T will be built as heretofore, but in much greater quantities, that's all."

Continental Moves Offices to Detroit.

Having completed its immense new factory in Detroit, the Continental Motor Mfg. Co. has removed its general offices to that city from Muskegon, the change becoming effective on the 1st inst. The Muskegon plant, however, will continue to be operated.

DURANT FORMS ANOTHER COMPANY

Apparently it Will Build Six-Cylinder Engines—Will be Part of Republic Project, but Details Are Lacking.

Although it was stated that only the Chevrolet Motor Co., of Detroit, and the Little Motor Car Co., of Flint, Mich., would constitute the foundation of W. C. Durant's $65,000,000 Republic Motor Co., it now transpires that the Sterling Motor Co., of Flint, Mich., also will become part of the organization.

The first that was known of the latter was when, last week, it was incorporated under the laws of Michigan with $300,000 capital stock. According to the best information, it will manufacture the six-cylinder engine, which will be used in the popular-priced "six" which will be added to the Little line. Heretofore, it was generally understood that the Mason Motor Co., of Flint, would manufacture all of the Little engines. The full meaning of the Sterling company, therefore, is not wholly plain, but at the Republic Motor Co.'s office in New York it is stated that at this time there is nothing more to be said on the subject. It is admitted, however, that the Sterling company will be a part of the Republic organization, but, as is the case with the Republic company itself, its officers have not yet been elected, nor, save Durant's, have any names been officially permitted to escape.

So far as concerns the Republic Motor Co. itself, it is understood that Durant himself will be its president and that among those associated with him will be R. F. Monroe, of the Monroe Body Co; R. A. Palmer, formerly general manager of the Cartercar Co.; J. D. Durant, of the Durant-Dort Co.; R. T. Armstrong, president of the J. B. Armstrong Mfg. Co.; W. M. Rands, of the Rands Mfg. Co., and, of course, W. H. Little, who for many years has been Durant's chief lieutenant and for whom the Little Motor Car company is named.

To Produce Brass Castings in Pontiac.

The Pontiac Auto Castings Co. has been organized with $15,000 capital stock in the Michigan city of that name. It is composed of residents of Detroit and of Muncie, Ind., and will erect a factory on Linfer street, where it will engage in the production of brass castings. Later, aluminum work and iron castings will be added to the output.

Substitutes "Motor Car" for "Buggy."

Its automobile productions having reached proportions that justify it, the Michigan Buggy Co., of Kalamazoo, Mich., has changed its title to the Michigan Motor Car Co. The ownership, however, remains the same as heretofore.

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SIX MILLIONS FOR A TIRE FILLER

Dahl Company, Greatly Enlarged, to Build Two Factories and Seek Foreign Favor —Headquarters Moved East.

With plans for an increased business, including an aggressive invasion of foreign markets, the Dahl Punctureless Tire Co. of America has been reorganized under the laws of South Dakota and has increased its capital from $100,000 to $6,000,000, has taken in several new men and perfected plans which will mean the erection of two new factories, one in New York and the other in Chicago, and will bring the company's headquarters from Minneapolis to New York City; there they will be established at 246-48 West 59th street, in the same building which shelters the Tire Core Co. of America, the Metropolitan, New Jersey and New England distributer of the Dahl product. Remodeling of additional offices in the 59th street building is now under way, and the end of a period of 60 days is expected to see the new activities in full swing. The company states that several moneyed men, who have allied themselves with the business, do not care to so appear publicly as yet and are not included in the new officers and directorate, which is as follows:

Amund N. Dahl, Minneapolis, president; Franklin H. Lewis, Minneapolis, vice-president; Thomas A. Callahan, Boston, Mass., second vice-president; C. J. Hagerling, Chicago, Ill., third vice-president; Russell V. Stuart, 246 West 59th street, New York City, secretary and general manager; Freling H. Stevens, Minneapolis, treasurer and counselor; Benjamin Dahl, Minneapolis, general superintendent. Board of directors —Amund N. Dahl, Minneapolis; Franklin H. Lewis, Minneapolis; Freling H. Stevens, Minneapolis; Benjamin Dahl, Minneapolis; I. Seery, Wausau, Wis.; Russell V. Stuart, New York City; Harmer St. Clair Denny, Buffalo, N. Y.; Thomas A. Callahan, Boston, Mass.; C. J. Hagerling, Chicago, Ill.

The new list is by no means a shakeup, as the president, vice-president, treasurer and superintendent in the old company hold the same offices in the new one; F. H. Stevens, however, who combined the offices of secretary and treasurer in the smaller Dahl concern, has relinqiushed his secretarial duties to Russell V. Stuart, who is also president of the Tire Core of America. Harmer St. Clair Denny, a member of the new board of directors, is treasurer of the Tire Core concern, while C. J. Hagerling, the new third vice-president, likewise has been identified previously with the Dahl interests, being general manager of the Punctureless Tire Co. of Illinois, another Dahl distributer. Thomas A. Callahan, one of the added directors, is a new recruit.

Dahl factories now are located in Minneapolis, Minn., and Millburn, N. J., and these plants will continue in operation; increased production facilities will be in the way of new factories rather than enlargements of the old plants. The Dahl product is a tire filler made of vegetable oils, rubber and other materials, and is now said to be in use on some 10,000 cars in the United States. Hitherto, according to the statement of Stuart, the new secretary, the American trade has kept both factories so busy that the company has been unable to cater to the foreign car owners as it now intends to do. Negotiations are now under way for the establishment of new agencies in the United States, although for some time the company has maintained a string of about 25 distributing centers.

R. C. H. Evolves Long Wheelbase Model.

The R-C-H Corporation, of Detroit, has added to its 1913 line a long wheelbase roadster which consists of the standard touring car chassis, with 110-inch wheelbase, upon which is mounted a newly designed body which retains, however, the English roadster lines familiar in the smaller two-passenger machines of this make. The chassis is not changed in any way, but the body is new, having low, deeply cushioned seats, a big 26-gallon gasolene tank behind the seat and a trunk, big enough for two suit cases, in the rear. To the regulation equipment of five electric lamps, 100-ampere hour battery, non-skid tires on demountable rims, speedometer, top with "Jiffy" curtains and boot, windshield, horn, tools, etc., have been added an extra non-skid tire on a demountable rim, carried in self-locking tire carriers on the running-board, and a trunk cover.

Plain Speaking About Gasolene Prices.

While in this country the Standard Oil Co. follows the say-nothing policy regarding the prodigious uplift in the price of gasolene, its prototype across the water, the British Petroleum Co., is not so close-mouthed nor diplomatic, as was made evident at a meeting of the special "petrol" committee appointed by the Royal Automobile Club to investigate existing conditions so far as they affect present high prices. When an official of the company was asked whether it were vain to cherish a hope of lower prices, he bluntly replied, "You're wasting your time in the vain hope of getting a lower price." Despite the hue and cry against present prices, the official of another company who was present at the conference stuck his tongue in his cheek and less bluntly, but more ridiculously, declared that "there is no man who objects to paying 36 cents for his 'spirit'; it is his smallest expense. Thirty-six cents," he added, "is not an extravagant price."

Haynes Opens Branch in Kansas City.

The Haynes Automobile Co., of Kokomo, Ind., has opened a branch in Kansas City at 1702 Grand avenue. It will be operated as the Kansas City Haynes Co.

CROSS-FIRE SUITS ARE TERMINATED

Palmer & Singer and Former Dealers Adjust Their Differences—Main Points of Troubles That Caused Litigation.

What once gave promise of developing into a warm legal battle came to an unpretentious finish Friday of last week, 30th ult., when two lawsuits in which the parties were the Palmer & Singer Mfg. Co. of New York City and Miller Bros., former dealers for that company in Philadelphia, Pa., were settled and discontinued; the unique feature of the litigation was that each had opportunity of being both plaintiff and defendant, and the amounts of money asked in each case were nearly equal, the suits, while entirely separate, having the nature of a claim and counterclaim.

Miller Bros., according to the Palmer & Singer contention, were unsatisfactory as dealers and the manufacturing company late last winter prepared to commence suit for some $20,000, alleging that this amount would have been realized in profits had the Millers paid more attention to business. But just about the time Palmer & Singer were ready to file the complaint the Millers "beat them to it" and commenced an action in the Supreme Court for New York County, asking an amount somewhere near the size of the Palmer & Singer claim; the allegation was that the Millers were entitled to the price of three cars and that "latent defects" in certain cars had caused a loss of profits. The makers, however, denied the defect part of the complaint and offered to submit the testimony of satisfied owners in the Philadelphia territory.

A few days after this action was commenced Palmer & Singer instituted their originally contemplated action, but in the Supreme Court for Kings County. After this initial activity the cases dragged, and there was little apparent progress until the orders of discontinuance were signed. The basis of settlement was not made public. The Millers now have the Kissel agency in New York City.

Wheel Plant to Produce Automobiles.

The Muncie Wheel Co., of Muncie, Ind., has purchased the stock and machinery of the Connersville Wheel Co., in Connersville, in the same state, and according to reports will utilize the plant for the manufacture of Empire automobiles for the Empire Automobile Co., of Indianapolis. Heretofore much of the Empire work has been done in a Greenville (Pa.) factory.

Henry Ford Back From Foreign Jaunt.

Henry Ford, president of the Ford Motor Co., of Detroit, returned from Europe on Monday last. He had been absent nearly two months, and as he was accompanied by his family the pursuit of pleasure was his chief aim while abroad.

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THE WEEK'S INCORPORATIONS




Toronto, Ont.—Crossleys Motor Co., under Ontario laws, with $50,000 capital; to deal in motor cars.

Detroit, Mich.—Traveler Motor Car Co., under Michigan laws, with $15,000 capital; to deal in motor cars.

Detroit, Mich.—Durable Top Specialty Co., under Michigan laws, with $15,000; to manufacture motor car tops.

Detroit, Mich.—T. C. Radiator Co., under Michigan laws, with $2,000 capital; to manufacture motor car radiators.

Detroit, Mich.—National Automobile Owners' Protective Association, under Michigan laws, with $2,000 capital.

Pontiac, Mich.—Pontiac Auto Castings Co., under Michigan laws, with $15,000 capital; to manufacture automobile castings.

Burlington, Iowa—Sheagren & Hunt, under Iowa laws, with $5,000 capital; to deal in motor cars. Corporators—Frederick Sheagran, J. Hunt.

Flint, Mich.—Sterling Motor Co., under Michigan laws, with $300,000 capital; to manufacture motor cars. Corporators—W. C. Durant and others.

Millbridge, Me.—Millbridge Motor Co., under Maine laws, with $10,000 capital; to deal in motor cars. Corporators—Joseph Sawyer, James S. Wyman.

Ashland, Ky.—Park City Auto Co., under Kentucky laws, with $1,000 capital; to deal in motor cars. Corporators—Howard Elhoff, Ben E. Tate, and others.

Indianapolis, Ind.—McLellen Auto Shop, under Indiana laws, with $1,000 capital; to repair motor cars. Corporators—F. P. McLellan, F. E. Barrett, J. M. Milne.

Augusta, Me.—Hallett Vehicle Tire Co., under Maine laws, with $500,000 capital; to manufacture motor car tires. Corporators—L. J. Coleman, C. E. Beane, and others.

Toronto, Ont.—Central Garage & Supply Co., under Ontario laws, with $150,000 capital; to operate a garage. Corporators—Robert B. Haley, Ernest N. Benyon, Roydon J. Haley.

Boston, Mass.—Tyler Bros. Corporation, under Massachusetts laws, with $100,000 capital; to deal in motor cars. Corporators—Frank J. Tyler, Lucius S. Tyler, John M. Gibbs.

Indianapolis, Ind.—Hydraulic Transmission Co., under Indiana laws, with $200,000 capital; to manufacture motor car devices. Corporators—William K. Ernest, Paul Milholland.

Indianapolis, Ind.—Indianapolis Automobile Clearing House, under Indiana laws, with $50,000 capital; to deal in motor cars. Corporators—E. J. Kane, F. E. Barrett, T. E. Byrne.

Oshawa, Ont.—Hacket Motor Co., Ltd., under Ontario laws, with $350,000 capital; to manufacture and deal in motor cars. Corporators—John Gray, Frederick Story, Trevor G. Merton.

Troy, N. Y.—Troy Motor Co., under New York laws, with $10,000 capital; to deal in motor cars. Corporators—Richard G. Thornmeyer, H. P. Schoonmaker, C. R. Kilmer, all of Albany.

Wilmington, Del.—Automobile Tire Filling Sales Co., under Delaware laws, with $1,000,000 capital; to manufacture tire filler. Corporators—G. G. Stiegler, O. W. Stiegler, W. F. Keefe.

Medina, Ohio.—Medina Machine Co., under Ohio laws, with $50,000 capital; to deal in and repair motor cars, etc. Corporators—F. W. Woods, F M. Branch, C. R. Warner, O. V. Roumeier.

Columbus, Ohio—Pharis Tire & Rubber Co., under Ohio laws, with $25,000 capital; to manufacture motor car tires. Corporators—Carl Pharis, May W. Pharis, Emma W. Pharis, Mable A. Pharis, Clara Weiler.

Buffalo, N. Y.—A. W. Haile Motor Co., under New York laws, with $25,000 capital; to deal in motor cars. Corporators—Arthur W. Haile, 1015 Main street; Bradley H. Phillips, E. C. Schlenker, both of Morgan Building.

New York, N. Y.—Gasosava Co., under New York laws, with $50,000 capital; to deal in motor cars. Corporators—John J. Smart, 4 West 31st street; George T. Keen, 56 West 33rd street; Eugene Cable, 2 West 32nd street.

New York, N. Y.—Globe Taxicab Co., under New York laws, with $2,000 capital; to operate taxicabs. Corporators—Morris Cox, 27 Smith street, Brooklyn; Charles Aaronson, 200 West 50th street; John Lambert, 310 West 55th street.

New York, N. Y.—Viking Mfg. Co., under New York laws, with $25,000 capital; to manufacture motor vehicles. Corporators—Arthur R. Bangs, Boston, Mass.; Richard Condon, 432 Columbus avenue; Albert O. Briggs, 220 Broadway.

New York, N. Y.—George Leveene Co., under New York laws, with $5,000 capital; to deal in motor cars. Corporators—George Leveene, 1 Livingston avenue, Yonkers; John L. Meyer, 600 West 142nd street; Charles E. Lauten, 2566 Broadway.

Buffalo, N. Y.—Buffalo-Akron Transit Co., under New York laws, with $2,000 capital; to operate a motor bus line. Corporators—William H. Pensyres, Gilbert Kunz, both of 891 Main street, Buffalo; Fred Christiansen, 1505 Jefferson street, Buffalo.

New York, N. Y.—Fiat Motor Sales Co., under New York laws, with $300,000 capital; to deal in motor cars. Corporators—Charles L. A. Whitney, 48 North Pearl street, Albany, N. Y.; William Scallon, 120 West 59th street; John N. Blair, 27 Washington Square.

New York, N. Y.—Triple Action Carburetter Co., under New York laws, with $200,000 capital; to manufacture carburetters. Corporators—Mathias Weiwoda, 348 East 10th street; Fred Hooschar, 1965 86th street, Brooklyn; Edmund F. Driggs, 161 Henry street, Brooklyn.

New York, N. Y.—Roulements E. Debois Ball Bearing Co., under New York laws, with $25,000 capital; to manufacture bearings. Corporators—John S. Sherman, 88 71st street, Brooklyn; W. W. Sherman, 6746 Second avenue, Brooklyn; H. T. Sherman, 854 70th street, Brooklyn.

New York, N. Y.—Ideal Automobile & Garage Co., under New York laws, with $10,000 capital; to deal in motor cars and operate a garage. Corporators—John W. Collopy, Jr., 2225 East 18th street; Reginald H. Smith, 10 Wall street; Alfred P. Morewood, 135 Westfield avenue, Elizabeth, N. J.

Indianapolis, Ind.—Koogle Automobile Co., under Indiana laws, with $10,000 capital; to deal in motor cars. Corporators—I. G. Koogle, L. B. Klein, L. D. Buenting.

Jacksonville, Fla.—Miller Auto Co., under Florida laws, with $10,000 capital; to deal in motor cars. Corporators—F. C. Miller and others.

New York, N. Y.—Damon-Munson Corporation, under New York laws, with $2,000 capital; to deal in motor cars. Corporators—Howard W. Munson, 374 Chilton avenue, Jamaica; Frank L. Damon, 505 Fulton street, Jamaica; Charles T. Hopkins, 472 Washington avenue, Brooklyn; Alexander Eger, Lake street, Jamaica.

Changes in Capitalization.

Chicago, Ill.—Hart Motor Car Co. from $10,000 to $25,000.

Detroit, Mich.—Sibley Motor Car Co. from $80,000 to $150,000.

Conshohocken, Pa.—Lee Tire & Rubber Co. from $1,200,000 to $1,600,000.

Cleveland, Ohio—Marathon Tire & Rubber Co. from $10,000 to $100,000.

Changes of Corporate Names.

Columbus, Ohio—E-M-F and Flanders Sale Co. to G. E. Thomas Co.

Dayton, Ohio—Stocker Rubber Co. to I. J. Cooper Co. and location to Cincinnati.

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ALLEN BEATS THE BANKERS AGAIN

Court Denies Motion of Defendants for New Trial—Litigation of Five Years Again May Be Appealed.

Although the defendants in the case which when it originally appeared in 1908 in the Supreme Court for New York County was entitled Allen-Kingston Motor Car Co. vs. Consolidated National Bank of New York, still insist that the plaintiff "has not a leg to stand on," the Allen side of the argument this week scored another point, when Judge Page, following a victory, a retrial and a second victory for the Allen interests, denied the banking interests' motion for a new trial and a dismissal of the complaint. The score now stands: Allen-Kingston, $29,553.44; Consolidated, .000000. The verdict represents $23,500 and interest, a sum which the Allen-Kingston company demanded as the loss on a contract with the New York Car & Truck Co., with which it claimed to have entered into the contract upon the representations of the defendants. The defendants now may appeal a second time to the Appellate Division, and this procedure is not unlikely.

The case harks back to July, 1907, when Walter C. Allen, who virtually constituted the Allen-Kingston company, entered into a contract with the Kingston Motor Car Co. for 100 cars, Allen putting up $16,500 as deposit on the order. The following Fall he was notified that the Kingston company had used up the $16,500 and all the other cash in sight and was unable to proceed farther, although but six cars had been built. The New York Car & Truck Co. then took over the contract, and a few months later went out of business.

Allen sued the bank and three officers and directors—E. R. Chapman, W. O. Allison and T. J. Lewis—claiming they were responsible for the transfer of the contract to the car and truck concern. That part of the action which was against the bank was dismissed, but a verdict against the three men was awarded. The Appellate Division, however, ordered a new trial, and this was completed in April last, when the jury again found for Allen. The defendants' attorney immediately asked the trial judge for a retrial, and after deliberating upon the matter until Tuesday of this week, 3rd inst., that member of the judiciary denied the motion.

Dunlop Absorbs its Sales Company.

As a measure of economy, the Dunlop Rubber Co., Ltd., which manufactures the tire of that name and which practically controls the tire trade in Great Britain, and the Dunlop Pneumatic Tire Co., Ltd., which markets the products of the manufacturing company, will be consolidated. The Dunlop Rubber Co. will take over the sale of its products and market the tire direct to the trade. Although separately conducted, the responsible men of the two companies are the same, but in bringing about the consolidation the Rubber company will pay to the Tire company, which will maintain a nominal existence, approximately $1,250,000 in cash for its assets. A further consideration will be given for the goodwill, trade mark, etc., in the form of royalty in perpetuity of 6 per cent. on the net profits earned by the Rubber company. According to reports rendered at a special meeting called to approve the amalgamation, the Dunlop automobile tire sales during the past year have increased 40 per cent., the motorcycle trade about 110 per cent. and the cycle trade by nearly 20 per cent.

Michigan Company for Pacific Coast.

To handle the Michigan car in California, Nevada, Hawaii and the Far East, the Michigan Motor Car Co., California Branch, has been organized with $1,000,000 capital stock, largely through the efforts of C. P. Kiel, of Oakland, Cal., who will have charge of it and who has represented the Michigan car on the Pacific Coast for four years. Most of the officers are identified also with the Michigan Motor Car Co., of Kalamazoo, Mich. They are as follows: V. L. Palmer, president; F. B. Lay, Jr., first vice-president; W. H. Cameron, second vice-president; George H. Daugherty, third vice-president; C. P. Kiel, treasurer and general manager; C. C. Robb, secretary. These officers, with H. L. Kiel, son of C. P. Kiel, constitute the board of directors. The new company will erect a thoroughly modern office, sales and service building, probably in San Francisco.

Cleveland Lamp Makers Expanding.

The Guide Motor Lamp Co., which at present is located on East Fourth street, Cleveland, O., has purchased a site on Madison avenue, N. W., upon which will be erected a new factory building. When completed the building will occupy the entire block on Madison avenue, between West 114th and West 115th streets. Building operations will be commenced at once.

Willys Abandons Yearly Model Policy.

Having abandoned the yearly model policy, so far as the Willys-Overland Co. is concerned, President John N. Willys, not unnaturally, has extended the policy to the Willys-Garford Co., which he also controls. He believes that the Overland and Garford cars now have reached the near-perfect stage which renders annual announcement unnecessary and inadvisable.

Michigan Truck Makers Locate Branches.

The Grand Rapids (Mich.) Motor Truck Co. has established a branch in Minneapolis with C. E. Haldeman as manager. Temporarily it is located in the Parker Garage in that city. Similar establishments are to be opened in New York, Boston, Philadelphia and Chicago.

MEN WHO HAVE SHIFTED POSITIONS

Resignations and Promotions That Served to Place Many Workers in New Places—None Leave the Trade.

W. C. Ruckert has been appointed manager of the Spokane (Wash.) branch of the Goodyear Tire & Rubber Co. He succeeds C. B. Clement, who resigned to become identified with the Studebaker interests in Portland, Ore.

P. D. Schenck, president of the Speedwell Motor Car Co. of Dayton, O., has assumed also the duties of general manager, and J. E. Schneider has been elected to the offices of secretary and treasurer. Both men have been with the Speedwell company since its inception.

W. H. Bell, manager of the pneumatic tire department of the Firestone Tire & Rubber Co., of Akron, O., has been transferred to San Francisco, where he has assumed the management of the Firestone branch in that city. He succeeds R. D. Barr, who temporarily was in charge and who has returned to the management of the Firestone company's establishment in Los Angeles.

S. B. Winn, district sales manager for the State of Michigan for the R-C-H Corporation, has relinquished that office to become general manager of the Hupp-Yeats Electric Car Co., of Detroit, which is intimately related to the R-C-H Corporation. The vacancy caused by his change has been filled by the appointment of M. D. Davidson, who at one time was connected with the R-C-H interests in Michigan but who latterly has been engaged in the automobile business in the East.

John C. Spiers, superintendent of the Splitdorf Electrical Co., of New York City and Newark, N. J., has resigned that position to become superintendent of the S. G. V. Co., of Reading, Pa., with which he previously was identified. Webb Stevens, who was Spiers's first assistant, has been promoted to the higher office. Previous to his departure for Reading, Spiers was tendered a farewell dinner by the Splitdorf department heads, at which he was presented with a watch fob and emblem in the form of a thirty-second degree Masonic charm.

Larger Factory for Four-Wheel Drivers.

The Ware Motor Vehicle Co., of Minneapolis, Minn., has let contracts for the erection of a new plant in that city at Helen and University avenues. It will be a four-story concrete structure, 90 x 200 feet, and will be ready for occupancy before January 1st, and, naturally, will permit a considerable increase in the output of the four-wheel drive vehicles which are the product manufactured by the Minneapolis company.

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Reek Bros. are preparing to open a garage in Marshall, Mich.

Samuel Hardin of Stonington, Ill., is about to build a garage.

S. J. Dawson, of Columbus, O., has had plans drawn for a garage.

Don P. M. McClure of Oscaloosa, Ia., has purchased the Anderson Garage.

Henry Young, of Ellsworth, Wis., is erecting a two-story fireproof garage.

O. W. Rowe, of Woodworth, N. D., has commenced the erection of a garage in that city.

D. Carson Fleming of Denver, Col., has commenced work upon the erection of a garage.

Clyde H. Smith Auto Co. is the style of a new firm in Skowhegan, Me. Cartercars are stocked.

George Davidson, of Argenta, Ark., has been granted permission to erect a garage in that city.

Francis Cooper of Langdon, N. D., will erect a garage in New Rockford in the same State.

D. E. Heaton of St. Joseph, Mich., shortly will erect a garage in that city. It will cost $10,000.

A permit has been issued to W. & J. Hubbard of Roxbury, Mass., for the erection of a garage.

H. J. Perin of Cincinnati, O., is having erected a two-story garage in that city. It will cost $23,000.

Arthur Peterson, of Philadelphia, Pa., is erecting a garage at 5950 Drexel Road. It will cost $2,000.

West & Richards, Nyberg agents and taxicab operators in North Dayton, O., have opened a garage.

The Overland Garage in Hutchinson, Kan., has been taken over by W. E. Hazlett and G. B. Pinkton.

Henry Grobert has had plans drawn for the erection of a brick garage in Newark, N. J. It will cost $28,000.

W. H. Pitts, of Caldwell, Kan., has bought out the garage business of G. F. Sicks. He will continue it.

Oscar Ritter and Duncan Taliaferro, both of Ardmore, Okla., are preparing to open a garage in that place.

Robert Flutro and Clarence Crawford, both of Danville, Ill., shortly will open a garage in Freeland Park, Ind.

Mall Jones has taken possession of a new garage building which just has been completed in Hutchinson, Kan.

Lawson Daines has purchased the garage in Athens, O., which formerly was conducted by the Athens Auto Co.

F. E. Parker, of Melrose, Mass., has purchased property and shortly will erect a modern garage in Scituate, Mass.

The Auto & Engine Supply Co. of Fort Madison, Ia., is making ready to erect a garage. The estimated cost is $10,000.

Wm. G. Faatz of Binghamton, N. Y., has purchased the building and garage business formerly owned by Howard Brown.

J. C. Lembke, of the Elliot Auto Co., which operates in the Iowa city for which it is named, has disposed of his interest.

Nutzman & Weitzel, of Lake View, Ia., have contracted for a garage to be built in that town. It will be a one-story structure.

Ole Ongstad, of Bemidiji, Minn., shortly will erect a garage in that city. It will be of concrete and steel and will be one story in height.

Theodore Bloom, of Osage City, Kan., has purchased from Fred Anderson his interest in the Osage City Garage & Machine Shop.

Lyon & Jones of Lorain, O., have purchased the Long Garage in that city and are planning extensive alterations pending a re-opening.

The property now occupied by the King Auto Co. of Bloomfield, Ia., has been purchased by Theodore Taylor, who will erect a garage upon it.

L. D. Moss of Homestead, Pa., has disposed of his interest in the Homestead Garage to T. S. Mitchell and has retired from the business.

Mrs. Clara Mendelson, of San Juan Capistrano, Cal., is having constructed a modern garage; when finished it will have capacity for 40 cars.

The firm of Wise & Kuhlemeier, which operated a garage in Pearl City, Ill., has been dissolved. Wise will continue the business in his own name.

The West End Garage Co. of Newark, N. J., has had plans prepared for a one-story brick garage. It will measure 58 x 100 feet and will cost $6,000.

The Crane Co. of Indianapolis, Ind., has been issued a permit to erect a garage. It will be of concrete and steel, five stories in height and will cost $20,000.

Colfax, Ia., shortly will have a new garage, the management of which will be in the hands of Hopkins & Stock, a firm recently formed for the purpose.

Jean Broner, of Havana, Ill., has purchased the repair and supplies department of the J. E. McCreery garage; he will continue the business at the old stand.

Sheagren & Hunt is the style of a new firm which has been formed in Burlington, Ia., to conduct a general garage business; they also will handle Chalmers cars.

Grand Rapids, Mich., soon will have another garage, preparations for the erection of which now are being made by Philo C. Fuller. The building will cost $50,000.

W. L. Hicks, former Overland dealer in Nashville, Tenn., is to enter the accessory field; he will open up at Third avenue and Commerce street with accessories only.

The B-K Garage in Farmington, Ill., has been sold to Arthur Street and L. A. Cadwalader; Theodore Bass, the former owner, continues to operate a garage in Canton.

Paul Kleiber and Emil Hanson, both of Racine, Wis., have purchased the Anderson Garage and will continue the business. They will also conduct a taxicab service.

M. Hall, of San Diego, Cal., has purchased a plot in that city and shortly will commence the erection of a modern fireproof garage. It will cost about $55,000.

Samuel H. Rosenthall of Chicago, Ill., has purchased from Harvey T. Weeks the two-story garage which stands at 2630 Wabash avenue. He will continue the business.

A receiver in bankruptcy has been appointed for Jarvis W. Matthews, who conducted a repair business in Bridgeport, Conn. The creditors' claims amount to $842.46.

The H. J. Jensen Garage in Sac City, Ia., has been purchased by a new firm which will continue the business under the style Newby Auto Co. Krit and Hudson cars are handled.

Preparatory to the erection of a garage, John B. Stetson Co. of Philadelphia, Pa., will demolish the buildings at northwest corner of Columbus avenue and Cadwallader street. The structure will be one story in height.

A. M. Harford of Dallas, Tex., and formerly connected with Butler Bros., in the same city, has opened the Dallas Automobile Exchange. He will deal largely with used cars.

Frank W. Johnson and Abner J. Selver, both of Eureka, Cal., are preparing to open a garage and repair shop. They will have the agency for Hudson, Haynes and Hupmobile cars.

Arthur C. Kendall, manager of the California Automobile Co.'s branch in Pasadena, has let the contract for the erection of a garage. Firestone-Columbus and Warren cars are handled.

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Henry Young is about to build a garage in Ellsworth, Wis.

Henry Lofthus has opened a garage in Morristown, S. D.

John Jacobson and his son have entered the garage field in Atchison, Kan.

John Sabers, of Salem, S. D., is about to open up a garage. He will have a 44-foot frontage.

A. J. Larson is about to build a garage in Lodi, Cal. It will represent an expenditure of $3,000.

Alexander C. Robarge and T. H. Field have established an automobile livery in Rice Lake, Wis.

James Waltz has purchased the interests of Charles Noel in the garage firm of Noel Bros., of Goshen, Ind.

The Baughman Garage in Newberg, Ore., has been sold to J. M. Dunnahoo; the latter already is in possession.

A garage is being erected in Chisholm, Minn., for J. J. Hayes; it will have a complete equipment of machinery.

J. W. Shaw, formerly of Grain Valley, Mo., has opened a garage and automobile livery in Blue Springs, in the same state.

Walter Powell, of Huntsville, Tex., has opened a garage; it will be operated in connection with his plumbing and tinning business.

Luther Alexander, of Peoria, Ill., has sold his automobile repair shop to Harry S. Bailey; the deal carires with it a motorcycle agency.

George O. Robinson and other business men of Bellaire, O., have organized a garage company; they will build a two-story fireproof structure.

John S. Vaterlands and Charles Andrew have let the contract for a garage to be erected in Chico, Cal. The plans call for an expenditure of $10,000.

Twin Valley Auto and Supply Co. is the style of a new corporation in Twin Valley, Minn. As its name implies, it will handle both cars and accessories.

B. Watterson, of Charles City, Ia., has purchased an interest in the O'Harrow Automobile Co. The other firm members are R. and C. H. O'Harrow.

J. J. Sullivan, of Cincinnati, O., has secured permission to erect a one and one-half story garage on Michigan avenue near Erie street; it will cost $6,500.

C. M. Burton, of Detroit, Mich., has been granted authority to build a brick garage on Brainard street between Second and Cass streets; the cost will be $3,000.

The Atlantic Land Co. of Pittsburgh, Pa., has been granted authority to erect a two-story brick and steel garage on Craig street; construction will begin at once.

King & Sons, of Great Bend, Kan., are building a garage in Manchester, Ia.; they will remove to the latter town and open up as soon as the building is ready for occupancy.

The Horton Motor Co. of Devil's Lake, N. D., is about to open a branch in Fargo, in the same state; the company has the Cadillac agency for North Dakota and eastern Montana.

J. C. Russell, W. R. Meyers and Sam Lewis, all of Columbia, Ky., have formed a company which will operate a motor 'bus line betwen that city and Campbellsville in the same state.

The Overland Co. is the style of a new distributing house in Wichita, Kan., just established by the Willys-Overland Co. O. J. Watson is manager; headquarters are at 238-40 South Market street.

Under the management of Charles E. Lavender and A. E. Kennard, a new supply business has been opened in Wheeling, W. Va. Lavender Auto Supply Co. is the style under which business will be operated.

Under the style Galena Motor Co., E. M. McCullough and P. H. Nelson of Chicago have opened up in Galena, Ill. Besides operating a garage, they are agents for Everitt cars, Randolph trucks and Republic tires.

Minnesota Cartercar Co. and Colorado Cartercar Co. are the styles of two new acquisitions to the trade; they are located respectively in Minneapolis and Denver and handle the cars indicated in the firm names.

Wm. Edwards of Rochester, Minn., has sold his interest in the garage business in which he was engaged to Henry Postier, who has taken a new partner. The new firm will do business under the style West & Postier.

The Brown-Symonds Co., of Los Angeles, Cal., has leased a new building on Pico street near Grand avenue and shortly will occupy it for the sale of Stutz cars. The building is of concrete and steel, 70 x 150 feet.

Berkeley Motor Car Co. is a new entry in the trade in Boston, Mass. It will specialize in Hudson and Chalmers used cars; F. H. Freeman, as manager, and George Tolman, both former automobile salesmen, compose the company.

W. F. Kneip and E. F. Williams have opened up as Franklin dealers at 3320-22 Main street, Kansas City, Mo. A service station is maintained. Kneip formerly was commercial car engineer and Williams chief tester for the H. H. Franklin Mfg. Co.

The William Jungclas Auto Co. of Cincinnati, O., has opened a branch in Covington, Ky., with W. H. Harmony as manager; the style of the new business is Southern Motor Car Co. Overland, Thomas and the Standard Electric cars will be carried.

The Fenway Garage Co., of Boston, Mass., has taken lease to property on Lansdowne avenue and Ipswich streets, and will erect a modern garage upon it. The building will be two stories in height and will afford 100,000 square feet of floor space.

Frank Pool, who has conducted a business in Ottawa, Ill., under the style Standard Tire Repair Co., has sold out to the Standard Garage and has entered the employ of that concern; the tire repair stock and machinery will be removed to the garage's location.

Kenneth Fosness of St. Paul, Minn., and F. H. Saterlee and R. H. Babcock of Minneapolis have formed an automobile selling co-partnership and are located at 142 West 5th street, St. Paul. They have the Fiat and Pope-Hartford agencies; Fosness also retains the Swinehart tire agency.

Finch & Freeman, retail automobile dealers of Indianapolis, Ind., have been appointed Indiana and Illinois distributers for the pleasure cars and commercial vehicles manufactured by the Nyberg Automobile Works, of Anderson, in the same state. Headquarters have been established on North Capitol avenue.

W. G. Tennant, who for some time has been head of the Peerless Motor Car Co. of New York, has resigned and will return to Chicago, whence he came. He will assume active management of the Tennant Motor, Ltd., of 2447 Michigan avenue, Chicago, distributors of Henderson cars, and will be associated with his brothers, J. G. and J. W. R. Tennant.

Columbia Motor & Implement Co. is the style of a new garage and selling firm in Columbia, Tenn.; the company comprises A. M. Thompson and L. K. Kinzer, who formerly constituted the Case Motor & Implement Co., and the new concern takes over the former Case business and the business and garage of the Maury Motor Co. Warren S. Titcomb, principal owner of the Maury company, has gone to Louisville, Ky., where he and W. B. Taylor will establish a Zilio tire filler agency.

The opposition which the Empire City Automobile Co., of 1800 Broadway, New York City, raised when three weeks ago three former employes sought to petition it into bankruptcy bore fruit Wednesday of this week, 4th inst., when Judge Hough in the Federal Court dismissed the employes' petition. The company claimed assets of $40,000 and liabilities of less than $3,000. The dismissal followed the failure of the petitioners to appear when the case was called. A week after a receiver had been appointed for the company upon the employes' petition the court, also, cancelled the appointment and the last move ends the matter.

Recent Losses by Fire.

La Crosse, Wis.—Jacob Zimmer, garage destroyed. Loss, $8,000.

Hanson, Mass.—Fuller & Keene, garage and five cars destroyed. Loss, $20,000.

Le Roy, N. Y.—Arch T. McCowan, garage and eight cars destroyed. Loss, unknown.

Pittsburgh, Pa.—J. W. Joint, 308 Electric avenue, garage destroyed. Loss, $16,000.

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THE MOTOR WORLD

PUBLISHED EVERY THURSDAY BY

The Motor World Publishing Company
1600 BROADWAY, NEW YORK, N. Y.

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Subscription, Per Annum (Postage Paid) $2.00
Single Copies (Postage Paid) . . . . . 10 Cents
Foreign and Canadian Subscriptions $3.00
Invariably in Advance.

Postage Stamps will be accepted in payment for subscriptions. Checks, Drafts and Money Orders should be made payable to The Motor World Publishing Co.

☞ Change of advertisements is not guaranteed unless copy therefor is in hand on SATURDAY preceding the date of publication.

Contributions concerning any subject of automobile interest are invited and, if acceptable, will be paid for; or, if unavailable, will be returned provided they are accompanied by return postage.

Cable Address, "MOTORWORLD," NEW YORK.

Entered as second-class matter at the New York Post Office, November, 1900.

NEW YORK, SEPTEMBER 5, 1912.

FADDISH CONSTRUCTION GROWN GROTESQUE.

Doubtless the fad-chasing propensity is responsible for the fact that in not a few cars the chauffeur, and of course the other occupant of the front seat, sit very low, almost on the floor, in fact, while the body rises high on each side and in front the overgrown cowl which surmounts the dashboard attains such a height that the driver can just about look over it and, what is worse, he cannot see the road immediately in front of the car. From the front, little of the driver except his head is visible over the top of a big steering wheel. His legs stick straight out in front in a position that is anything but comfortable, however advantageous it may be as a means of economizing space vertically.

This form of construction of course originated in cars built purely for speed. The driver's position helps to keep the center of gravity low, very considerably reduces the air resistance that is such an important factor at extreme speeds, and affords no little protection from the dust and the small pebbles that seem to inhabit the air during road races. The fact that the road directly ahead is invisible is of no consequence, for at racing speeds the driver sees only the road a considerable distance ahead. But for a pleasure car—a machine that is intended to be driven somewhere within hailing distance of legal speed limits and that is expected to afford some degree of comfort to its ocupants—there seems as little reason for almost wholly concealing the driver and other occupants as there is for destroying their comfort. Moderately low front seats are advantageous in that they help to make the chauffeur a little less conspicuous to the occupants of the rear seat, and high sides and cowl are excellent in their way, but to carry these things to extremes in a car designed for pleasure serves no better purpose than to make what probably is a really fine machine appear grotesque and ridiculous.

CONCERNING THE VALUE OF BUMPERS.

It slowly, very slowly, is percolating through the trade mind, and through the mind of users, that a bumper is a pretty good thing to have attached to the front of a car. The realization on the part of the trade is not yet so distinct that the bumper has become a part of the regular equipment, but in the natural course of events, particularly as completeness of equipment has become a vital selling factor, it is by no means improbable that sooner rather than later the bumper will become as much of a car's equipment as, for instance, a clock or a coat rail. Certainly it serves more useful purposes.

In the larger cities, at any rate, the driver is fortunate who goes through many seasons without sustaining damage to his lamps, his fenders or his radiator, all of which a bumper will protect. It does not take a very great blow to put any of those necessaries out of commission, and, peculiarly enough, the damage sustained farely greatly exceeds the $25 limit at which the responsibility of insurance companies begins. In fact, it is well known that in fixing the limit the insurance people themselves had in mind their escape from responsibility for the very damage, most of which can be avoided by the use of bumpers.

It is only after one has had a radiator punctured or a lamp twisted askew by collision with or being backed into by another car that the bumper seriously enters into the considerations of the average owner. The number of such accidents, however, has been sufficient to leaven the mass, and the value of such protection is being more largely realized with the days.

LAW NEEDED TO MINIMIZE SKIDDING.

"Saving fools from their folly" rarely is a thankful task, but the number of fools who persist in driving motor cars barren of preventives of tire skidding when streets or roads are wet and slippery is so large it appears that utimately the power of the law will be brought to bear.

It is only during an extended period of rain or otherwise inclement weather, that it is possible to obtain a true conception of the extent to which such unprotected cars are used and the number that then are found devoid of non-skid tire treads, or tire chains, is not short of amazing; the wonder is not that accidents are so many but that they are so few, conditions considered. As it rapidly is coming to be quite generally appreciated that a skidding car is wholly "out of hand" of even the most skilful, it is fairly clear that a day of reckoning is almost due.

If self-preservation is not a sufficient impelling force, the general public should be considered. It is not such a far cry to the era when state and municipal authorities were legislating against the use of non-skidding devices, but, as the Motor World at that time predicted would be the case, the day is not far distant when the law will require their use and impose a penalty for the use of cars which flagrantly infringe the rules of safety. It does not seem likely that anything short of such laws will serve to save the foolhardy ones from their folly.

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SELF STARTER OR MOTOR STARTER?

Prospective Purchaser, Finding Himself Confused, Helps Enlighten Salesman—But What's the Use? He Asks.

"Good morning," said the Prospective Purchaser to the Smiling Salesman. "What is new in automobiles?"

"Well, there's nothing new in ours," replied the S. S., shaking hands with the P. P., but here a new wrinkle-dingus that you haven't seen yet," and he lifted the hood of the car, showing an excrescence on the motor that was not on the other models on the floor.

"What's that?"

"That's a self-starter, sir."

"How does it work?"

"Why you just make yourself comfortable on the seat, pull this little lever on the dashboard, push this button, and the motor starts without any of the grinding business."

"Great stuff!" commented the P. P.; "but I thought you said it was a self-starter."

"So it is; you don't have to touch the crank."

"But what good does it do to have the thing start itself?"

"What good does it do? Why, it starts the motor."

"A moment ago you said it was a self-starter, which means that it starts itself, and now you say that it starts the motor, which means that it is a motor starter. What the dickens is it, anyway—a self-starter or a motor-starter?"

"Now that you mention it," said the S. S. meditatively, "it doesn't start anything but the motor, so it's a motor starter. Thanks, horribly! that's a mighty good point. . . . Oh, excuse me a minute. Hello, Jonesey, old top; how's the health? Come on over and see the self-starter."

"What's the use!" muttered the P. P., as he closed the door behind him.

Proof of Poor Salesmanship.

Rivalry among automobile manufacturers is acute, if good natured, and if you care to believe a story that is going the rounds—and disbelief will not spoil the point of it—at a recent dinner of manufacturers' representatives which occurred in Hartford, Conn., one guest dwelt at length on the remarkable popularity of his car and the wonderful organization of its selling force.

"Why, just think of it, gentlemen," he exclaimed, "last month our sales averaged a car every two minutes of each working day. There never was anything like it in the world—a car every two minutes." He dwelt on this point volubly and at length.

When at last he had concluded the representative of a rival factory arose from his chair down the table and remarked: "With the last speaker's permission, I would like to offer my comment on his statement that there's one of his cars sold every two minutes." Permission was granted. "I understood you to say that you call that good salesmanship. Am I right?"

"I certainly do," affirmed the previous speaker.

"Well, I don't; that's all. I call it mighty poor salesmanship."

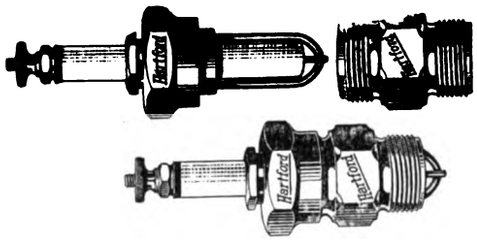
"What do you mean?" demanded the boaster. "A car every two minutes——"

"Poor salesmanship—there's no other name for it. The gentleman forgets the universally accepted truth that 'there's a sucker born every minute.'"

After which the next speaker was introduced.

Here's Hartford's Two-Piece Spark Plug.

It is a quite generally recognized fact that while the sootless motor is a thing to be devoutly hoped for, it is not yet among the realities; and as long as motors produce soot and carbon, so long will spark plugs accumulate their share. Therefore a spark plug that is easy to clean is a thing much to be desired, and it is this kind of a plug that has been brought out by the Hartford Suspension Co., of Jersey City, N. J., which has made an enviable reputation as manufacturer of the Truffault-Hartford shock absorber. The plug, as the Motor World stated, has been in hand for several months, but just has reached the marketable stage. The new plug is called the Hartford two-piece plug, and its name is an accurate description of the principle upon which it is built. The lower part of the plug is screwed into the cylinder and is left there; when the plug is to be cleaned the upper part only is removed. This brings out the porcelain so that it can be inspected and cleaned without difficulty. The construction is simple and sensible, and is quite clearly shown in the accompanying illustration.



Paris Offers Premium for a Splash-Guard.

That the "splash-guard" trials held in France last year were not entirely successful, in that they did not bring to light a device that solved the problem of keeping mud in its proper place, is indicated by the announcement that further trials of a similar nature are to be held by the Municipality of Paris in conjunction with the omnibus companies, entries for which must be made not later than October 1st with the Paris Municipality. No restriction is placed on the nationality of the inventor and the promoters of the tests desire as comprehensive an entry list as possible that the results may be conclusive.

A prize of $400 is offered for the best device, and it is further promised that the city will acquire the patent rights, or at least place a substantial order for a supply. After the method of attachment has been investigated—and this point is considered one of much importance—tests will be made on the wheels of single-decked omnibuses traveling over a muddy road at the rate of 12 miles an hour. This will be followed by a test of 100 working hours in actual service in the Paris streets, and a final "rough-usage test," in which ability to stand contact with curbs and the like will be brought out. The program of the competition is calculated to provide tests which will prove conclusively the degree of serviceability of the devices.



September 7, Hamline, Minn.—Track races promoted by the Minnesota State Fair Association.

September 7, Brighton Beach, N. Y.—Track races under the auspices of E. A. Moross.

September 7-9, Santa Clara, Cal.—Road races under the auspices of the Santa Clara County Fair Association.

September 9, Fon du Lac, Wis.—Track races under the auspices of J. A. Sloan.

September 9-11, Chicago, Ill.—Chicago Motor Club's reliability run for commercial vehicles.

September 10, Allentown, Pa.—Track races promoted by E. A. Moross.

September 11, Grand Rapids, Mich.—Track races under the auspices of the Grand Rapids Automobile Club.

September 10-14, Buffalo, N. Y.—Automobile Club of Buffalo's reliability tour.

September 13, Sandusky, Ohio.—Track races promoted by E. A. Moross.

September 17, Milwaukee, Wis.—Grand Prize road race under the auspices of the Milwaukee Automobile Dealers' Association.

September 21, Milwaukee, Wis.—Vanderbilt Cup race on the Greenfield course, under the auspices of the Milwaukee Automobile Dealers' Association.

September 21, Detroit, Mich.—Track races under the auspices of the Michigan State Agricultural Society.

October 7, Detroit, Mich.—Start of the National Reliability tour to New Orleans, for the Glidden, Anderson and National trophies.

October 7-11, Chicago, Ill.—Chicago Motor Club's reliability run.

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MAKING MOST OF "DEMONSTRATORS"

Salesman Who Combats Argument That Demonstrations Mean Depreciation and Who Turns Them to Advantage—Seeking Out "Prospects."

Somehow or other I never have been able to understand the hue and cry raised by some dealers over the loss they claim to sustain because of the depreciation of their demonstration cars," remarked S. W. Kessler, who, during the course of several years, has served both as inside and outside salesman for a number of prominent metropolitan dealers, and who latterly has roamed Long Island in the interests of the Tanner Motor Car Co., of Brooklyn, N. Y. It is a position which carries with it the searching out of almost every nook and cranny on Long Island, and in the effort to promote sales and assist the Tanner sub-agents to make sales, Kessler, an uncommonly observant and well-posted man, has acquired experience which is not to be despised.

"Of course, I've heard the stories of the heavy losses due to that source," went on Kessler when the subject of demonstration cars was under discussion, "but I don't think we have been forced to sell more than half a dozen demonstrators at less than list price, and never were they sold at a loss. After a fashion, I may say that we really have no demonstration cars, for as soon as we sell one we put a new car into service and repeat the process throughout the season. We probably use twenty or more cars for demonstrating purposes in the course of a year, and instead of selling them at a loss we have found that purchasers have no objection to paying full price for a car which has been used for a week or two or which has seen 400 or 500 miles of service. As a matter of fact, many purchasers prefer such cars, or, at any rate, I always find it easy to persuade them that the use we have given the car had served to 'run it in' and 'limber it up' and generally to make it better suited for the owner's own hand. There also is a very small proportion of purchasers who are possessed of the notion that there is something special about demonstrating cars and they are particularly keen to obtain them and pay the full price. They seem to fancy that they are factory samples and jump at the chance to buy them. I do not mean to say that I have not encountered people who think that because the tires of a car are slightly soiled it has become a second-hand car and, therefore, it is of greatly reduced value, but these people are few and far between, and such demonstrators as we have sold below list are those which were unfortunate enough to have become scratched, tarnished or otherwise very slightly damaged in their demonstrating work."

As a result of his almost continuous travels, Kessler believes that too many dealers are content to be mere repairmen or garage keepers. Were it otherwise more of them would sell a greater number of cars. As it is, they make only such sales as come to their doors. It has been one of Kessler's duties to promote sales for such agents, and in doing so he, of course, has had varied and instructive experience.

Most of his prospects, he says, have been obtained through users of cars which he represents, as he makes it a point to become well acquainted with the latter. They usually, purposely or in casual conversation, tip him off to those of their friends who are thinking or talking of automobile purchases. It is Kessler's business then to seek them out and, as adroitly as he can, to fan their enthusiasm to the purchasing point. He is a man of good address, and in pursuing this policy he does not go at his prospects roughshod. In other words, he does not at once "talk shop" or suggest demonstrations; rather does he wait opportunities to drop in and remark that he is going somewhere or other and invite his prospect to accompany him. Such outings are made sufficiently extended to enable Kessler to gauge the depth of his guest's interest and, if he proves keen enough, to make the most of the occasion.

"And I've made more than one sale," added Kessler in relating some of his experiences, "while sitting around the hotels at night and extending invitations for 'short rides.' Only the other day I switched a sale of a rival car which practically had been made. The man who accompanied me on the ride already owns a car and I had learned that he practically had decided on the purchase of a new one. When I got back to the hotel I had him enthusiastic over our car and practically converted, but he informed me that I would have to convert the 'missus' before he could give me the order, as she was particularly impressed with the car he puposed to buy. I took them both for a ride the next morning—not for a demonstration, mind you—and I got the order before the day was far gone."

American Offers $2,500 for Carburetter.

G. H. Chamberlin, one of the founders of the Automobile Club of America and who in the early days was a conspicuous figure in A. C. A. affairs, has offered a prize to the value of $2,500 for the best carburetter. In doing so, however, he did not make the offer through the club which he assisted in founding, but instead went far from home to attain his ends. He has made his offer through the Royal Automobile Club of Great Britain, and the award will be determined by tests conducted by the technical commmittee of the British organization, which has accepted the Chamberlin proposal. A sub-committee of the R. A. C. is formulating the rules.

TRAINING MEN FOR DEALERS' SERVICE

Factory Which Maintains School for Repairmen on Whom Agents Have First Call—How it is Conducted and Some Conclusions Reached.

If, as frequently is asserted and as doubtless is more or less true, the problem of the automobile dealer's business existence is to maintain a satisfactory repair service such that his customers will be satisfied, the dealers who handle the products of the H. H. Franklin Mfg. Co., of Syracuse, N. Y., should be relieved of all such distress by reason of a certain clause in the contracts which they are required to sign; this paragraph provides that factory-trained workmen must be available in the garages of all Franklin dealers, and to assist in the carrying out of this provision the Franklin company maintains at its plant a school for repairmen, which, in discipline and curriculum, is equal or superior to many so-called automobile schools.

The school was started several years ago, and that it has resulted in increased satisfaction among owners of the air-cooled cars goes without saying; on the other hand, that the repairmen themselves are well satisfied is indicated by the fact that 80 per cent. of the school's graduates are still with the company and its representatives.

"Married men over 25 years are most successful in the automobile repair shop," is one of the comments of Professor I. O. Hoffman, who is the head of the school, to which he devotes himself exclusively. "The dealers prefer married men over 30. The reason is that married men are more responsible and take up the work more permanently than do young unmarried men. The married men adapt themselves to all circumstances in a new place and after graduating from a repairmen's school are less apt to drift into something else.

"We find that the most important quality in a good repairman is judgment—the ability to analyze. The man who does not know 'why' is absolutely unable to analyze because he has no basis to work on. The men are trained to take up motor car troubles much as a physician goes over a new 'case.' 'Symptoms' are traced to their origin and the graduate repairman never 'operates' without cause. The student is taught to think along certain lines and his efficiency is brought to a maximum through this training. The factory trained repairman is equipped to speedily locate and cope with difficulties and to prevent their recurrence, if possible, with certainty."

The Franklin school course covers a period of time from 28 to 35 weeks. The course takes the men through all parts of

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the Franklin factory, with special emphasis on the work in the repair shop and assembly rooms, particularly the engine assembly.

It takes up both the theories of the automobile and the practical application of the theories. A text book is used and students have regular classroom work. One of the buildings at the factory has two regularly fitted classrooms and has in every way the equipment of an up-to-date school.

As a final test of the men before they are sent out by the Franklin company, the class this year will have to build an automobile of parts taken from Franklin models of several years. A recent class did this and built a Franklin machine with a 1908 truck engine and several 1907, 1906 and 1905 parts. In fact, there were about seven years' models represented on the machine when it was finally put together and ready for the road.

Another test of the men is a long road test. On this machines that have been "queered" are sent out and the repairmen have to find out what is the matter. This gives them practical experience on the road and when they have survived these tests they are competent to fill the position of repairmen in any Franklin shop.

There are no written examinations in this school, but the work of each student is noted in a classbook in the regular way. The general workmanship of the man is sized up by the instructor and no one is sent out until he is fully qualified in every respect. During the entire course of the school the men are paid wages commensurate with the value of the work they are capable of performing measured by the regular factory standards.

Professor Hoffman is a graduate of Purdue University, and at that institution devoted his attention to automobile engineering. Besides the repairmen's course, instruction is provided in driving, and here are trained chauffeurs for owners of Franklin cars; often, also, owners—and oftentimes they are women—attend the school when purchasing a Franklin car for the first time.

There is an additional and separate division known as the apprentice class, consisting of young men who are taking a four years' mechanical course in the factory and school. Sustaining wages are paid, increasing each year, and at the end of the term of tuition the boys are possessed of a mechanical education such as could be gained otherwise only with a technical school course. In addition, they have the advantage of a practical working knowledge of methods in the factory in which it is intended they shall be given desirable positions after graduation.

To Keep Oil Stone in Condition.

A small oilstone can be kept in the best of condition by wrapping it in cloth when not in use. The cloth absorbs the oil and in this way prevents the gumming up of the pores and keeps the stone cutting freely.

STUDEBAKER THAT SHARPENS SAWS

Wandering Workshop That Calls on Its Customers—How a Motor Car Doubled A Saw-filing Business.

It is an easy matter to figure just how a motor car can be a profitable adjunct to almost any large business; as a matter of fact, there are very few important money earning pursuits that do not profit, at least indirectly, by the use of motor cars. But when it comes to making profitable use of a motor car in a business which concerns itself solely and exclusively with the filing of saws, it is pretty evident that the machine must possess in a high degree the ability to increase earnings. All of which is by way of leading up to the information that the car shown in the accompanying illustration is a Studebaker "20" with a special body designed for the business of saw-filing and nothing else, and that it is making good, in the vernacular—which is synonymous with making money.



STUDEBAKER "20" AS A PERAMBULATING WORKSHOP

The machine belongs to J. W. Kain, of Chicago, who uses it to cover the whole city and the suburbs, his customers including butchers, carpenters and others to whom saws are near and dear; as yet the surgical profession has not been mentioned. The owner avers that he can cover more than twice the ground with the car that he could with the horse and wagon that went before.

It goes without saying that the interior is fitted up with all the necessaries of the saw-filing industry, such as bench, vises, tool racks and the like. The height is sufficient for the workman to stand up and labor in comfort. There is but one door, and when it and the windows are closed the car is weather-proof. The windows drop for ventilating purposes. The half seat in the body permits easy access to the interior without undue cutting up of the body.

Ford's Use of Steel and Matting.

Mere figures do not always serve to convey the full force of an illustration; thus, although the Ford Motor Co. will use more than 90,000 tons of steel during the next twelve months—only the International Harvester Co. is a larger user of the metal —the magnitude of the Ford purchase is made far more impressive when it is brought out that the 90,000 tons of steel is equivalent to 3,000 freight car loads, and that a single train carrying it would extend for a distance of 21 miles. Similarly, the Ford company used something like 755 square miles of coca matting during 1912. Of course, it was not received in one roll, nor was it used in one piece. It was cut into small squares which served as floor carpets for the more than 75,000 Ford cars which were produced this year.

Chamois that May not Strain Wisely.

The use of a chamois skin strainer for gasolene is a valuable safeguard against the entrance of water and dirt into the tank; but it is not quite infallible in preventing the clogging of the gasolene line, for the simple reason that sometimes the gasolene carries with it fine particles from the leather, which in time accumulate on the fine gauze strainer and choke it. All chamois will not do this, and a new skin is more likely to "shed" fuzz than an old one.

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"KNOWING THINGS" AS THE SALESMAN'S WEAPON

Wherein Knowledge of Trade Happenings and of Other Cars is as Essential as Knowledge of One's Own Line—Dealer Reilly Classifies Types of Sales Managers.

"Hello, Jim, come right in; it's only a social session," shouted Reilly, as the Sales Manager, appearing in the door of the dealer's private office, grip in hand, hesitated as he saw that Reilly was engaged in conversation with a sales representative of a rival automobile manufacturing concern.

The Sales Manager knew the other salesman—in fact, there were few he did not know, at least by sight—but that the third man did not know the Sales Manager was evident by the startled countenance the former displayed as Reilly smilingly made the two acquainted with a "Jim, I want you to know Mr. Gregory—two rival sales managers should not remain unacquainted."

"O—ah—is this your sales manager, Mr. Reilly?"

"He claims to be," responded the little dealer.

"I've often heard of you, but never had the pleasure of meeting you before," added the third man, addressing the Sales Manager.

"I've known you some time by sight and really am glad to know you personally," was the reply.

From then on standard subjects, such as the weather, the crops and free tolls through the Panama Canal were with difficulty dragged up and paraded, but within ten minutes Reilly's first visitor, having been caught red-handed trying to steal a live-wire dealer from a rival house, decided he would be more comfortable elsewhere and made a relieved adieu. As the interloper made his exit Reilly's and the Sales Manager's eyes met, and broad smiles overspread their faces at the discomfiture of the departing salesman.

"Say!" ejaculated Reilly, "I never was so glad to see anyone in my life as I was to see you this morning; not because I am particularly tickled to look at you, but you have ridded me of that guy. Otherwise there is no telling how long I would have had to endure him."

"What's he after?" queried the Sales Manager with a smile that indicated only too plainly that he was, at least, suspicious.

"What do you suppose he's after? Me! I'm the prize package; but he might as well have stayed in bed; he would have gotten more benefit from the forenoon than he did by coming here—and so would I."

"Has he got a good proposition," interrogated the factory man.

"He sure has; you've got to give it to them on that. His house makes an offer that really beats the one you people make me, but, bah! I wouldn't sign up under that guy if he gave 150 per cent. commission."

"Isn't he the man who went with that company ten months ago and who was going to be such hot stuff?" asked the Sales Manager.

"That's the boy; that's the boy," fired back Reilly. "He thought he was going to be the guy that put the dust in industry. But, fooey! he couldn't even raise the dust on a country road in July."

"What's the matter with him?"

"O, just bonehead," was the answer. "He would be pretty good if he had a few pointers and took advantage of them; but, say! he's so far from being like you that he isn't even the same kind of an animal."

"Bouquets?" asked the Sales Manager.

"If you so regard it," said Reilly, "but it's true. He's been after me for six months to drop your line and take on his, but the more I see of him the farther he gets from me and a contract. He, however, is only one of a lot more; too many sales managers and district managers I know are just like that gink. They hold down a fine-sounding job but they don't know their business."

"What do you mean?" asked the Sales Manager, and he was in earnest, for this discussion of sales managers was getting pretty close to home.

"I don't mean that they don't know some of the rules of salesmanship, but that they think a general knowledge of salesmanship would pull them out of any hole. Now, take this fellow, for instance; he would be a good sales manager if he knew more about conditions in the trade and paid more attention to things outside his own factory. About all he does is to talk wise around the factory about the car that is made there and, of course, the rest of the organization thinks he is a real smart lad. He gets away with that stuff at the factory and the established business goes along after a fashion, but—now when he comes to see some one like me, for instance, he falls down hard.

"The first time he came to see me he started in to feel me out, and I told him I might take on another line if I got something that suited me better. I would, too, but I know them all and thus far have failed even to hear rumors of anything that would even begin to suit me as well as what I have now. He started in and told me all about his car and its good points and why it would be a red hot proposition for a dealer. I let him ramble and then asked him if he thought his line was an better than mine. He almost felt insulte at that, but when he calmed down enoug to say he thought it was, I asked him why and you ought to have seen him flounde He didn't know any more about our car than a Hindoo. Then I asked him abou some other cars, and every time he wa stumped. All he knew was his own car and as to making comparisons between hi own and another make of car, he couldn' do it. I don't say that making comparison and saying derogatory things about othe cars is good salesmanship, but a man ought to know something about a few of his competitors' vehicles.

"It is only a matter of going into a fight with your eyes shut. If you're going to fight you've got to know the enemy. Take the police! How do they contend against crooks? They get to know them and their methods. How do doctors combat disease? They study it; they not only know what the medicines they have will do, but they know what to expect to meet in cases of sickness. That's what spies are for in war; they help the fight by letting the fighters know what the other side is doing. This sales manager you just scared out of here is like the British soldiers who came to America to fight Indians once upon a time and who insisted on marching into the woods just as if they were fighting white men. Every schoolboy knows how they had to be rescued by the American woodsmen, who knew how the Indians would fight and who fought back the same way. This having a fine car is all right, but a sales manager, to be a real one, ought to be able to point out a few differences if the occasion demands it.

"And a lot of them don't seem to buckle down and make a study of the business. They don't know anything about what is going on in the trade. One district manager blew in one day and tried to pull me over; in the course of the conversation I asked him how his company stood in relation to the Dyer patents. He gasped once or twice and said he never heard of them. I explained about how they cover sliding transmissions and about how the Board of Trade had secured rights under them, and he wanted to know 'where in hell I got all my dope.' He seemed surprised when I told him I read a trade paper now and then. He tried to switch the conversation by handing out some confidential information on a combination of several old-time automobile men in a new company, and he almost collapsed when I showed him the whole story in a Motor World three weeks old. I handed it to him to read, and at the same time he also discovered that one

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of his dealers in a nearby town had taken on another line and was about to build a new garage to handle both lines together. All he said was 'Gol!' He left shortly after that.

"A truck man dropped in on me another day and wanted me to sign up to sell trucks. We got into a discussion of trucks in general, and it wasn't long before I had him guessing on points about makes other than his own, and once or twice I really had to tell him he was mistaken. When he insisted he was right I trotted out my trade papers and showed him stories describing and comparing the features we had been discussing. At first he said, 'Aw, what you read in a paper isn't so,' but when I showed him dyed-in-the-wool photographs he quit. He said he never supposed there was anything in the trade papers but a lot of bunk. I asked him how he kept track of what was going on in the world at large. He said 'newspapers.' And I asked him how he ever expected to keep track of things in the trade if he didn't read trade newspapers. Also, I showed him the difference; I showed him how some of the trade papers run long descriptive articles or touring articles that appeal to the owner of a car and play for the support of the user, and I also pointed out how what the dealer wants is the trade paper that goes after the news of the trade and prints it and confines its technical stuff to things that will be a benefit to the dealer and that is written so he can understand it. It took a long time for a lot of the trade papers to realize that, but more of them are trying now to follow the lead of the pioneers in the news game. And it is taking as much time for a lot of so-called managers, and dealers, too, to learn the real value of really good trade papers.

"You accused me a while ago of throwing bouquets at you. Well, here's the biggest one yet: You know all the things I said about that guy that was here when you came in? Well, all of those things you ain't. You just naturally make a good sales manager because, somehow or other, you can't help it, I guess. I know you are posted on things in the trade because anyone can talk with you and you talk as if you knew a little bit about what you were talking about. You read the trade papers because they interest you just as much as the daily paper interests the average man. When you read that big things are doing in some quarter of the trade you watch the trade papers and follow it up. If there is an article about the positioning of radiators you go through it pretty thoroughly, because it gives a good comparison and tells the good and bad points of different methods; then if you are ever asked about other cars, as I have noticed, you have things pretty well at your fingers' ends and don't get caught in a tight corner. You watch how other makers build and why; you know the trend in manufacture, and just because you are interested in your work you make a regular study of things, even if you don't realize that you are studying.

"If a man who is in the market for a car gets up against a salesman, the man is going to ask all sorts of questions, if he has any knowledge of cars at all; the salesman who knows about other makes can answer these questions and make comparisons and can lead the man along until he begins to see the good points of the car the salesman is trying to sell rise into prominence through the haze of uncertainty and obscurity which has hitherto clouded all cars for the buyer, and he is almost certain to buy a car. But this guy that's been after me! All he can do is tell what a good thing his own car is, and he tries to evade questions about other cars; this makes a customer wary, and he gets an idea there is something the salesman is trying to cover up—something regarding his car and other cars that is better left unsaid—and the customer is likely to bolt because of this seemingly withheld information, whereas the salesman gladly would give it if he knew. A salesman can't know too much about anything."

"Tell, me Reilly," interrupted the Sales Manager, "are there really many salesmen like that?"

"There are a great many like that," answered the dealer, "but I hesitate to call them salesmen. A drummer friend of mine says there are three types—order takers, peddlers and salesmen. The order taker goes in, says 'Want anything to-day?' takes the order, if there is one, and goes. The peddler lays out his wares, displays them to best advantage, tries to make them sell themselves and makes a sale if he can. The salesman goes out and makes a man buy something he doesn't want simply by persuading him into thinking he wants it. And a salesman has got to do more than lay out his wares and trust to them to sell themselves."

"But how is it, Reilly, that old Blackburn, who is such a poor sales manager, turned out a son who is a hummer? You'd think he'd be more like his old man."

"The only explanation I know of," answered Reilly, "is the explanation an old boozer back where I was born used to tell when asked why his son didn't drink. 'Some people preach against intemperance,' said the old bum, 'but I was the "horrible example"—it's much more effective.'"

"Were you going to stay long? Can't you stop for dinner?" asked Reilly, for the dealer lived in a town where they eat dinner along about noon instead of just as the chickens are retiring.

"No, I am on my way up-State and just dropped in to take a look at you. I really must be going."

The Sales Manager rose and reached for his grip, but Reilly, with a hand on the shoulder, pushed him back into the chair.

"Sit down, sit down!" he whispered; "here comes another district manager. Stick around long enough to scare him out."

The arriving district manager never fully arrived. He was half-way across the showroom floor when he spotted the Sales Manager. Although the Sales Manager was a benign and kindly faced young man, the district manager indicated a busy day by a glance at his watch and discreetly retreated. So complete was the rout that Reilly felt that it was safe for the Sales Manager to go almost immediately.

Los Angeles Police Head Has an Idea.

The police commissioner of Los Angeles, Cal., has joined the ranks of those who have proposed freakish legislation for the automatic arrest of motorists and has suggested to the City Council that it pass an ordinance making obligatory the use of a speed detecting device. The council, however, has yet to pass the measure. The proposition is to provide a device in which are white, green and red electric lights; when the car is going eight miles an hour the white light will show, at fifteen miles the green light appears and at twenty miles, the speed limit, the motorist flashes his own red danger signal and the corner policeman has only to make the arrest, the red light being sufficient evidence.

Sun's Rays Cause Gasolene Fire.

A lively imagination and a complete disregard for veracity form a combination from which strange tales can spring; but it is doubtful if even this union can produce a story more remarkable than that of a German motorist who stopped his car in the middle of a road, in the open sunlight, to investigate the cause of a carburetter leak. While he was looking around the dripping gasolene suddenly caught fire, apparently without cause, and it was some time before the motorist, having extinguished the fire, found that the lens of one of his lamps had swung open and the sun, shining through it, had focussed on the dripping gasolene and set fire to it.

"Honey Fitz" After Official "Joy-Riders."

Mayor Fitzgerald of Boston, who is best known to fame as "Honey Fitz" and who has a faculty of getting into the limelight through lack of geographical and other knowledge, has intruded his hand into the motor car affairs of Boston and proposes to abolish official "joy-riding." He has directed Real Estate Expert Kiley to pick out a site for a Municipal Garage, and besides inaugurating a system whereby tabs may be kept on the city's cars, the mayor proposes to have the chauffeurs do considerable of their own repair work.

Ohio's Tags to be Maroon and White.

Maroon letters on a white background will distinguish Ohio's license tags for the year 1913, and 60,000 or 75,000 will be made. The Secretary of State has let the contract to the Scioto Sign Co., of Kenton, O., which will supply the number plates for 22¼ cents a set.

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FINE COMBING OF THE MAXWELLS

It Results in One New Model and Many Minor Improvements—Left-Hand Drive for Two of Their Models.

Apart from developing one new model listing at $785, in bringing the Maxwell line into shape for the 1913 season two things have been borne in mind by the maker, the United States Motor Co.: the decreased demand for cars with but two cylinders, which has resulted in the elimination of the double opposed model styled the Messenger, and the advisability of rendering the always easy riding cars which in modified form are retained in the line even more comfortable. To this end the wheelbase and rear spring measurements on both the "40," which takes the place of the Special of last year, and the "30," which supercedes the Mascotte, have been increased, and larger wheels are used, and even more significant, left-hand drive and center control have been adopted for two of the three models, the "40" and the "22." The latter is the new model which is designed to take the place of the discontinued Messenger.

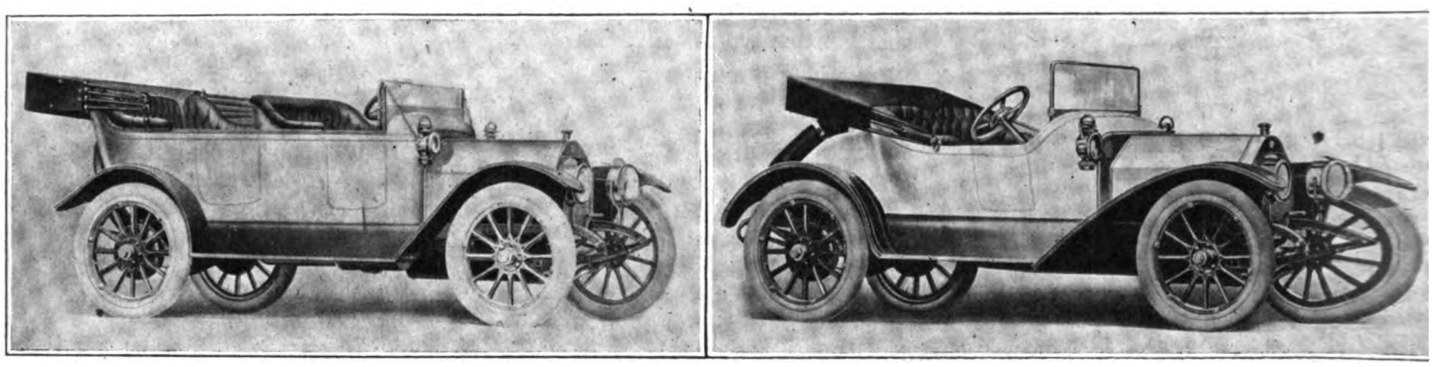
Naturally body designs and dimensions have been considerably revised, a few inches in length or breadth added here and there by way of supplying more room in the tonneaus and the seats made more comfortable by increasing the height of the backs and the depth of the Turkish upholstery.

Five body designs are supplied in connection with the three chassis. The "40," fitted with a touring car body, is listed at $1,675; with a roadster body it sells for $1,625. The "30" in touring car and roadster form sells for $1,145 and $1,110, respectively. The smallest chassis, the "22," is fitted with only a roadster body and lists at $785.

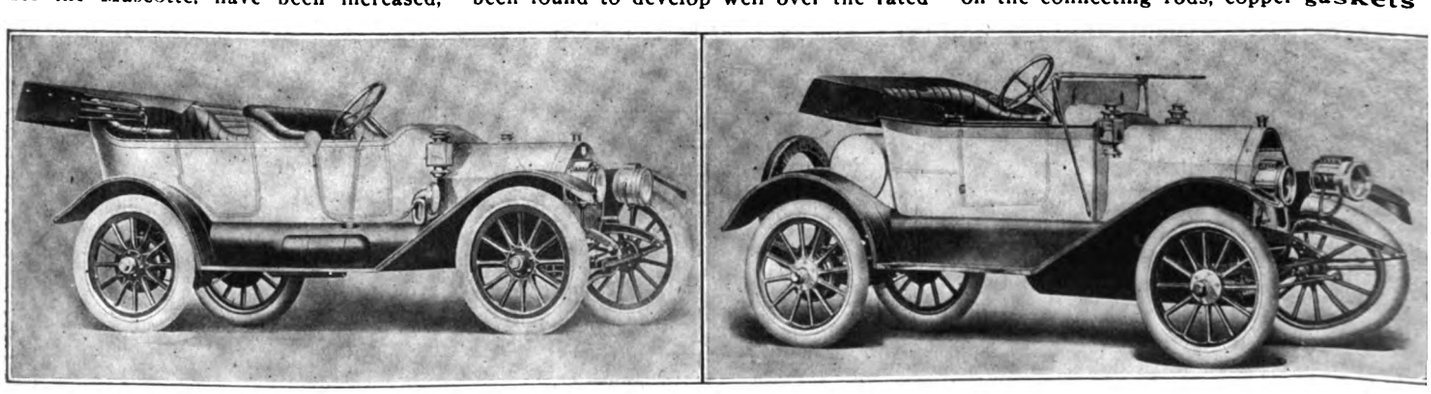
Many are the small improvements which go to differentiate the "40" from its predecessor. In the motor, for instance, while the bore and stroke remain 4½ x 5½ inches, respectively, the connecting rods have been lengthened, and the combustion chamber enlarged so that withal the compression has been reduced by nearly 10 pounds from the point at which it stood in the cars of last year, and exemplifying the degree to which the motor of last year's model was underrated, it may be stated that even with the reduced compression the motor has been found to develop well over the rated power, which is 4 horsepower better than last year. The pistons have been considerably lightened, and by way of preventing carbonization due to oil working past the pistons, a new oil return has been fitted. To further reduce the weight three piston rings instead of four are fitted, and stuffing glands provided with felt washers are provided on the tappet guides to prevent the loss of lubricant and the ingress of dust and dirt. The fan mounting and adjustment are entirely new in design; the mounting now forms an integral part of the water manifold. An entirely new design of carburetter, which is made in the Max factory, replaces the one heretofore u The device is of the well-known singl venturi tube type wherein the tube is right and is joined to the vertical tub the inlet manifold by the orthodox bc flanges. The needle valve which cont the flow through the single jet is set a angle so that the valve stem is easily cessible. The air inlet is adjustable means of a rotary valve, also convenie located, which is operated by means vane and which is prevented from jarr out of the position by the pressure o set screw. The float chamber is cast fr aluminum, which makes the device tremely light and at the same time d not detract from its strength or durabil

Among the minor improvements, all which are calculated to make the mo more efficient or more accessible, are provision of relief cocks, larger oil scoo on the connecting rods, copper gaskets the inlet and exhaust manifolds, new ig tion wire supports, a sleeve cast integ with the exhaust manifold through whi air is conducted to the carburetter and new inlet manifold. Although the therm siphonic method of circulating the cooli water still is adhered to, a larger diamet discharge pipe is provided and, due to t positioning of the new fan mounting, t discharge pipe is not branched as heret fore.

The Maxwell policy of making "w enough" even better is exemplified by t changes which have been made in the fran



MAXWELL "40" 5 PASSENGER TOURING CAR AT $1675 AND THE "40" ROADSTER WHICH SELLS FOR $50 LESS



MAXWELL "30" 5 PASSENGER TOURING CAR AT $1,145 AND THE NEW "22" ROADSTER THAT LISTS AT $785

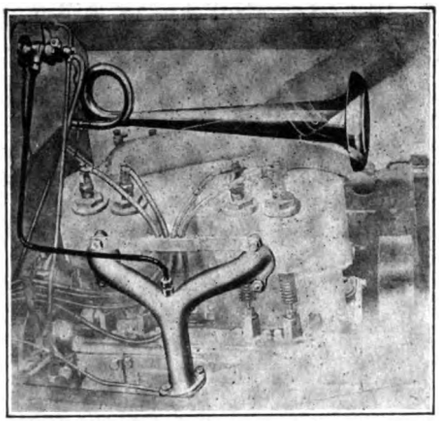
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and running gear design. As previously stated, the wheelbase has been increased—from 113 to 114 inches—and the wheels from 34 to 36 inches in diameter, and an extra inch has been added to the rear springs. The same type of full-floating rear axle is employed, but the square propeller shaft has been increased in size, as have the shaft bearings and the universal joints in which provision has been made for the reception of ample lubricant and which are protected by leather covers. The brake equalizers which previously were included have been discarded, and the braking system has been otherwise altered by provision for greater leverage on the service and emergency brakes and the adoption of a more readily adjustable turnbuckle.

The adoption of the left-hand steering and center control, which naturally calls for the brake and change gear levers being positioned between the two front seats, has made the adoption of a selectively operated gearset advisable because of the smaller arc through which the lever must be swung. The steering system itself has been improved by the adoption of grease cups in place of the oilers which were formerly used, and the use of a lighter aluminum steering wheel.

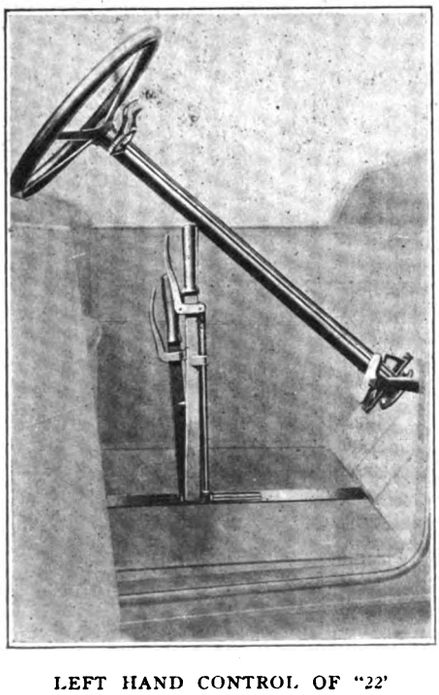
Body changes are principally in the way of refinement—a general smoothing out of the lines and the adoption of more gracefully shaped mud guards. The seats, both front and rear, have been lowered slightly and the tonneau made roomier; extra upholstery pockets have been added and the ventilators through the dash made larger. The dash itself has been cleared of all save the necessary fixings in the shape of a sight feed for the lubricating system, the Splitdorf tube-switch-transformer coil, the speedometer and the button for operating the acetylene engine starter.

Besides the top, windshield, speedometer, under-hood horn and tire irons, which go to make up the more than usually complete equipment, are furnished a gas tank positioned in an out-of-the-way place under the dash, and combination oil and electric



HORN AND STARTER OF "22"

side lights and gas head lights. The electric lights are supplied by the storage battery, though the Gray & Davis lighting system is supplied as "extra."



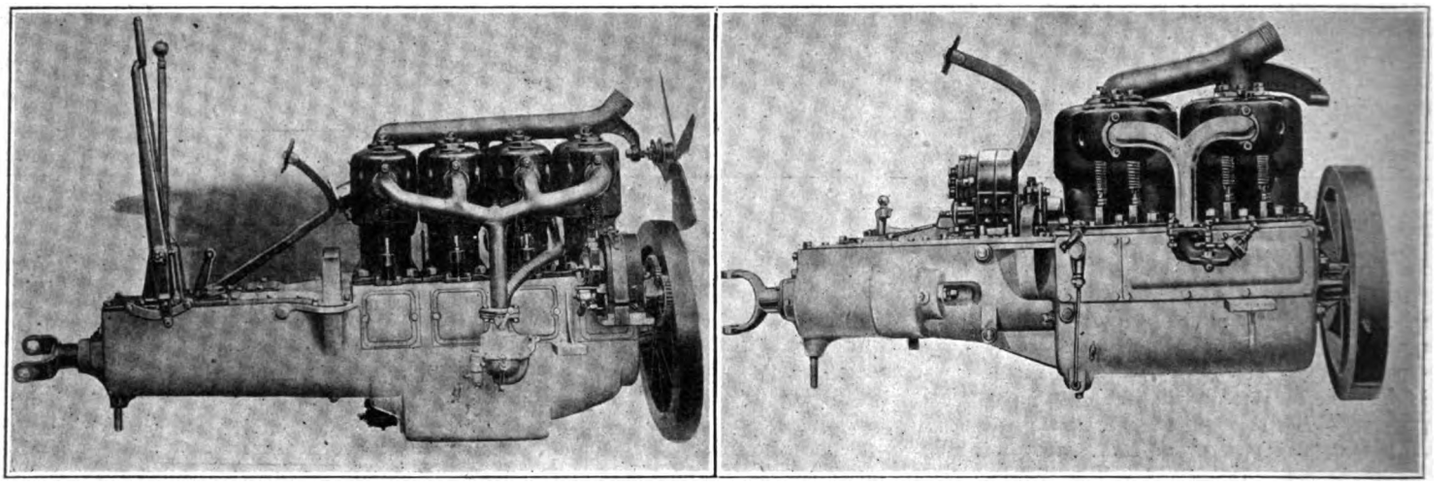
LEFT HAND CONTROL OF "22"

The engine starters which are supplied on all Maxwell cars are made in the Maxwell factory. They are of the ignition type in which acetylene gas is piped under pressure from the gas tank and injected into the cylinders, the action being controlled by the simple pressure on a valve which is positioned on the dash of the car. In the smaller model the gas is piped to the manifold and the gas is injected into the cylinders after the spark has been cut off when the motor is stopped, providing a charge for starting.

In the "30" right-hand control is retained and changes in the design of the motor are not so numerous, though they are more or less important. The cylinders which formerly measured 4 x 4 inches now scale 4 x 4⅝ inches, and the flexibility of the motor has been further increased by the use of longer connecting rods. The cylinders are set directly on the center with the crankshaft, not offset. As is the case with the "40," the pistons have been re-designed for lightness and more perfect lubrication. Both the main bearings and those of the cam shaft have been made larger; the cams have been made integral with the shaft.

The most notable improvements which have been made in the frame and running gear design are the adoption of a front axle of I-beam cross-section in place of the tubular type which heretofore has been used, and the use of a new spring suspension which causes the frame to hang lower. The wheelbase has undergone a lengthening similar to the "40" and the wheel diameters increased. A new type of steering knuckle has been adopted which permits of the turning of the vehicle in a much smaller radius. Little details have been well taken care of; the bottom of the control levers has been housed to prevent the ingress of dirt, and grease cups placed at many points in the transmission and steering systems where oilers formerly were used.

The equipment practically is the same as that which is supplied with the "30" save



MOTORS OF THE MAXWELL "40" AND "22," THE LATTER SHOWING UNUSUAL MAGNETO MOUNTING

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that the horn is not concealed under the bonnet.

The introduction of the four-cylinder car at a popular price as exemplified by the 22-horsepower roadster takes the maker into a field which it has heretofore not exploited. As with the largest model in the new Maxwell line, the newcomer is designed for left hand drive and center control.

The motor is of the T-head type, with cylinders 3¾ x 4 inches, cast in pairs, and bears all of the earmarks of the two larger Maxwell motors. As is the case with the latter, the flywheel is positioned forward and the clutch, gearset and crankcase are combined to form a unit power plant. The specially heat-treated crankshaft is mounted on three bearings of ample proportions. Cooling is affected by thermo-siphonic circulation, as is the case with motors of the larger models, and a honeycomb radiator of more or less striking design is provided. Dual ignition, embracing the use of a Splitdorf magneto and coil, is adhered to; lubrication is accomplished by a combination of both splash and force feed, a plunger pump driven from the cam shaft being employed.

Power is transmitted to the rear wheels through the intermediary of a multiple disk clutch embracing the use of 15 disks of crucible saw steel and a three-speed forward and reverse progressive gearset. The orthodox propeller shaft fitted with two universal joints connects the gearset to the rear axle. The rear axle is of the semi-floating type and is fitted with ball and roller bearings. The front axle is made of seamless drawn steel and is tubular. Full elliptic springs are used in front and three-quarter elliptic springs in the rear.

Included in the equipment are top, top boot, windshield, gas tank, engine starter and five lamps.

Heat Insulation Instead of Ventilators.

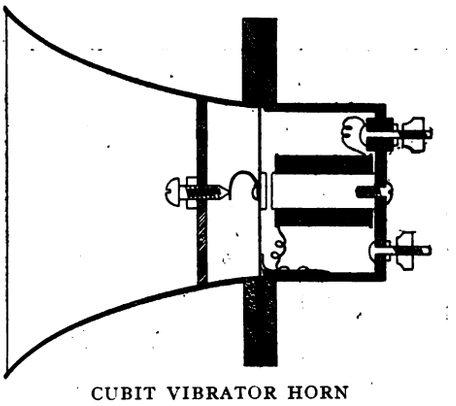
To render unnecessary the use of ventilators in the dash or front doors, the Keystone Hair Insulator Co., of Pittsburg, Pa., has developed a material styled Thermofelt, which is intended to prevent the heat of the engine penetrating the dash and floorboards. It is designed to be cut to fit the dashboard under the hood and to be tacked directly thereto. It is also applied to the underside of the floorboards in the front half of the car. Thermofelt is a resilient fire-proof and water-proof felt, one-quarter to one-half inch thick, and "represents the happy blending of asbestos and other fibers in such proportions as to afford the maximum of insulation within a minimum of thickness." On each side of this felt are enclosing sheets of asbestos mill-board covered by a waterproofing to protect the fabric from water when the car is being washed. Material of the best, while, of course, applicable to new cars, will afford an easy means of making more comfortable the thousands of old cars that are minus ventilators.

ELECTRIC HORN THAT SELLS FOR $3.

Cubit Company Making Ready to Market Lowest-Priced Signal—Magnet and Diaphragm Principal Parts.

Already keen, it is probable that a still sharper edge will be given the market for electric horns by the Cubit Electric Horn Co., of 105 Chambers street, New York, which is making ready to offer to the trade a horn of the sort at the amazingly low price of $3. The horn is the invention of John R. Mack, an uncommonly well-informed man, who with Charles T. Cubit constitutes the Cubit company.

The horn itself is both extremely simple and ingenious in its makeup. It is of the vibrator type, but has no separate vibrator,



CUBIT VIBRATOR HORN

the diaphragm itself serving the purpose. As the accompanying illustration shows clearly, the diaphragm is clamped between the flanges of the two sections that form the body of the horn; it is insulated, however, from both sections by means of cork or rubber gaskets, but is electrically connected with the rear section by means of a small insulated steel finger. The back of the diaphragm carries a disk of iron which serves as the armature for the electromagnet, while on the front of the diaphragm is a spring which normally is in contact with an adjusting screw threaded through a crossbar in the throat of the bell. Two binding screws are provided for the battery connections, one of which is grounded. The magnet terminals go one to the insulated binding post and the other to the steel finger which makes contact with the diaphragm.

The action of the instrument, when current is passed through it, is exactly the same as the action of any electrical device of the vibrating type. The armature is attracted to the magnet, drawing the diaphragm center with it—in other words, slightly buckling the steel disk. This movement is just sufficient to move the C-shaped spring out of contact with the screw in the crossbar, which immediately breaks the circuit and the current stops flowing. The instant the current ceases to flow the magnet loses its attraction for the armature, and the spring of the diaphragm draws the armature back and at the same time brings the C-shaped spring into contact with the pointed screw. This again establishes the electrical circuit, and the same thing is repeated continuously with enormous rapidity, setting up a loud buzz that is amplified by the broad surface of the diaphragm and the bell-shaped horn.

Not only does the inventor claim maximum simplicity for the Cubit horn, but an unusually small current consumption—about 1¼ amperes. The fact that the horn, under test, operated for something more than seven hours continuously without showing any signs of giving up or breaking down is attributed to the low amperage,, which was not sufficient to burn or in any way impair the efficiency of the contact points.

Co-operative Car Owning for Commuters.

Co-operative ownership and use of motor cars rarely has proved happy. In Chicago, however, according to the Kissel branch in that city, there is an exception to the rule. It consists of three former commuters, all married, whose total railroad transportation averaged something like $70 per month, which included the round trips of the three men six days a week and eight trips a month for each of their wives. As a means of economy they pooled issues and purchased a Kissel car which they are using instead of railroad trains. As a result, they report a saving of about $10 per month. The total monthly maintenance figures out at $60.50, which includes gasolene, oil, tires, garage hire and repairs and an additional $28 for depreciation. The families have a written understanding regarding the use of the car. A schoolboy brother drives the three men to business and calls for them at the end of the day. In the meantime the wives on alternate days boss the car. Every third Sunday each family has it.

Omaha May Restrict Taxicab Stands.

Taxicab drivers and hackmen in Omaha, Neb., will be entirely shut off from downtown stands if a measure now being prepared is passed by the municipal council; no taxicab will be allowed to stand east of 16th street or west of 13th street between Jackson and Davenport streets. They will, however, be permitted to drive up in front of a hotel and wait a reasonable length of time for a fare.

Declutching as Means of Saving Tires.

The best way to drive a car over a short stretch of broken stone is to take a short run at it—not too fast—and let the car coast over the stone with the clutch out. Thus the rear tires are relieved of driving strains and of the resulting tearing action of sharp stones on the rubber. Of course, it is not always practicable to do this, but when it can be done it adds just a little more to the life of the tires.

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REFINEMENT OF THE UNISPARKER

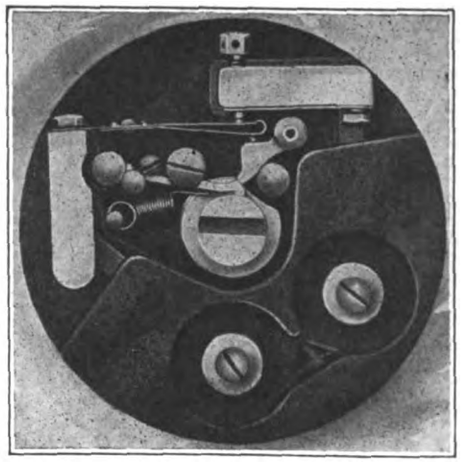
Automatic Timing and Silence in Re-designed Atwater Kent Device—Whole Mechanism in One Case.

While the development of the automatic electric lighting system for motor cars has made electric illumination something very different from what it used to be, thanks to the combination of dynamo, storage battery and automatic control, the abundant and reliable supply of low-tension current that the lighting system makes available has had the effect of reviving interest in battery ignition systems, which naturally were put somewhat in the shade by the rather meteoric rise of the high-tension magneto. The argument is that if there is an abundant supply of current already available without the use of additional apparatus, that current should be used for the ignition system in preference to installing additional apparatus for the generation of another kind of current. The argument is carried a step further in the query, If two separate ignition systems are installed, what is gained by making them of different types? Why not make them duplicates in every way, so that both can make use of the same source of energy?

Such at least are the opinions advanced by the Atwater Kent Mfg. Works, of Philadelphia, whose ignition apparatus is designed with economy of current as one of the chief considerations. The company reports that it already has felt the stimulus of a livelier interest in battery ignition systems, and for this reason, if for no other, is enjoying the consciousness of having done well in re-designing its well-known Unisparker, which has been brought right up to date through the adoption of improvements that, while considerably altering some details and adding new features, have left intact the original features—the short, quick contact, which is just as brief at low as at high speeds, and the consequent economy of current, and the impossibility of causing a spark when the instrument is rotated in the reverse direction. To the improved timing mechanism has been added an automatic ignition timing governor, which is enclosed below the timer and in the same casing and which can be used or not, at the driver's will. Lastly, and perhaps not least, in these days of ultra-quiet gasolene cars, the timer has been so worked out that the familiar click-click-clicking of the older type of contact mechanism is entirely lacking, and the Unisparker now is as economical in the matter of noise as it is in the matter of current, which is saying a great deal.

The timing mechanism is clearly shown in the accompanying illustration. The central shaft with the slotted end has cut in it as many notches as there are cylinders to be fired; these are not shown because they are cut below the line of the periphery, but they are in line with the hooked end of the little steel member which bears on the shaft. The notches are made with one side a trifle undercut, so as to catch the little hook, and the other side sloped away gradually. When the timer is rotated in the right direction—which is clockwise in this case—the hook drops gradually into the notch until caught by the steep shoulder. The hook then is pulled a little way around with the shaft until the notch, moving around the circle, slips from under the hook, which thus is released and flies back under the light but quick pull of the little coiled spring.

The action of the hook is the secret of the whole timer and is decidedly peculiar. On the forward motion, when the hook travels with the shaft, its position down in the notch prevents the projection on the back of the hook from coming in contact with the trigger-shaped piece which is shown



NEW UNISPARKER TIMER

just above in the illustration. On the return, however, the hook rides up on the plain surface of the shaft, out of the notch, and as it flies back it strikes the little trigger a blow, pushing it against the long, flat spring above it. The flat spring, which is double, carries a platinum contact point which is, in turn, pushed against a similar platinum point on the fixed block, establishing an electrical connection which is instantly broken by the receding hook. So rapid is the action that it is practically impossible to see the make and break of the platinum points, and only with difficulty can the flash-like movement of the trigger be seen. As the work all is done on the return movement, under the pull of the spring, it does not matter how fast or how slowly the shaft rotates—the length of contact will be the same in all cases, and there is no waste of current through protracted contact. Furthermore, it is impossible for the timer to come to a stop in such a position that current will continue to flow, owing to the action of the spring in always pulling the hook away from the trigger. Incidentally, the celerity of movement of the little hook is due largely to the fact that it is not pivoted or rigidly guided, but is loosely held and moves almost without friction; the coiled spring which acts as a retractor at the same time holds the end against the rotating shaft. The two oblong blocks are, of course, the terminal blocks; it is a peculiarity of the new Unisparker that there is no ground connection, both the low-tension leads being insulated and carried to the two screws shown near the bottom of the illustration, which are connected each to one of the blocks, one of which carries the spring and the other the platinum point with which the point on the spring makes contact. The double form of the spring carrying the moving contact point makes it impossible for the points to "hammer" unduly and also avoids the slowing up of the breaker through resistance to the movement of this part.

The automatic spark advancing governor, which is mounted under the timer on an extension shaft, is of the centrifugal type. The shaft is not continuous, but is divided, the connection between the two sections being made through linkage in the governor mechanism. Due to its peculiar construction, it is impossible to describe the arrangement of the linkage in detail, but the action is such that the weights, flying outward by centrifugal force as the timer revolves, tend to rotate the shafts through a small angle in opposite directions; the higher the speed the wider the range of movement. Of course, the arrangement is such that the increasing speed advances the timer section of the shaft. The governor is in perfect mechanical balance throughout; all the parts are in duplicate, and every movement is attended by an exactly opposite movement of a corresponding part. The automatic timing range is as nearly accurate as it can be made without having in view the requirements of any particular type of motor; the governor can be cut out and the regulation effected by hand if so desired.

The silencing of the new Unisparker is due to the lightness of the moving parts, the very small range of movement and the light tension of the springs; to the fact that the plate upon which these parts are mounted is not attached directly to the enclosing case, but rests upon felt pads on a plate which is screwed to the case, which, however, it does not touch, the screws maintaining an air space all round; and to the muffling effect of the steel casing, which is of one piece, stamped from the sheet. The cover of the casing carries connections for the high-tension cables, the distributer head being carried on the top of the shaft, which is notched for the purpose, as the illustration shows.

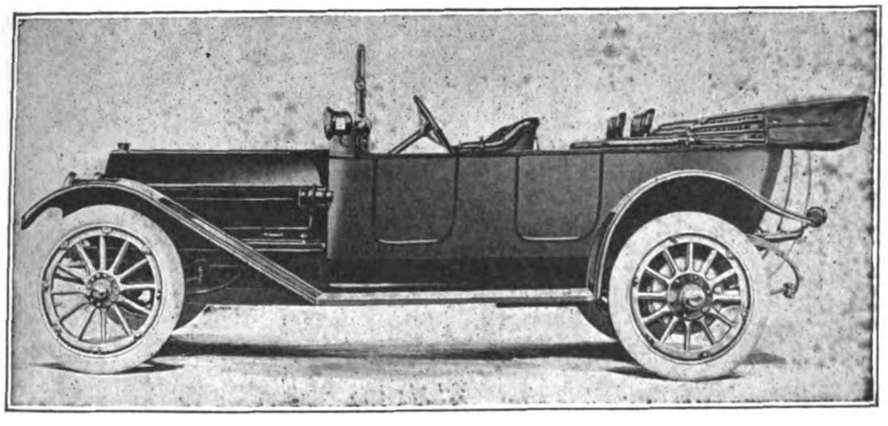
The complete instrument—timer, distributer and governor—enclosed in a single case forms an exceedingly neat and compact set, and while there is little, if any, liability of derangement, the smaller parts and those that are most subject to wear are the most easily reached for inspection.

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WARREN CHRISTENS ITS NEW "SIX"

Styled "Resolute," New Comer Prove Worthy Addition to Family—Has Block Motor and Other Modern Features.

If any doubt existed as to the position that will be occupied by the six-cylinder car, it has been swept away by the long succession of announcements of new "sixes" made by makers of cars of all sorts and sizes, big and little, high-priced and low-priced. One after another they have swung into line with the sextuplets that have been more or less quietly working up through the incubation stages, and among the latest, to escape from the shell and flap its winds in public, to keep the metaphor going, is the Warren "Resolute," as the new "six" of the Warren Motor Car Co., of Detroit, Mich., has been styled. Two four-cylinder models, the "Wolverine," a 35-horsepower 5 passenger touring car, and the "Pilgrim," a 40-horsepower touring car of the same capacity, also are listed, the whole line embodying those mechanical principles upon which the past reputation of the Warren company is founded, together with improvements suggested by experience. The "six," however, is the feature and the culminating point of the new output.



NEW WARREN "SIX" WITH BLOCK CAST MOTOR

As the illustration shows, the outward appearance of the new model Warren leaves little to be desired. The long, straight lines, almost severely simple, are just sufficiently relieved by the curves of the mudguards and of the front and rear ends of the body so that there is an entire absence of the "boxy" appearance that is so easily developed by unskilled body designing. The rear mudguards are carried well back in a curve that is graceful as well as useful.

In the design of the motor experience with Warren four-cylinder cars has been liberally referred to, and Warren practice is followed in casting the cylinders in a single block, in making the cylinders of the L-head type, with valves all on one side, and in carrying the crankshaft, which is no less than 2¼ inches in diameter, in three bearings. The length of the front bearing is 4 inches, the middle bearing 3 inches and the rear bearing, which carries the weight of the flywheel, 6 inches; the bearings are of phosphor bronze lined with babbit. The cylinders are of 4 inches bore and 5 inches stroke. Lubrication is by constant level splash, with pump circulation of the oil, and there is a sight feed on the dashboard; each connecting rod end dips into a separate trough. Two separate ignition systems provide insurance against sparking trouble; one includes a Bosch high tension magneto and the other a storage battery, single coil and distributer. The water circulating pump is driven from the magneto shaft.

There is nothing unfamiliar and, by the same token, nothing that is untried in the power transmission system. The ample leather-faced cone clutch, the big, double universal joints and the gearset mounted on roller bearings all are of tested merit. The rear axle is of the full-floating type, and between it and the gearbox there are two universal joints, of the same short, heavy design as those between the clutch and the gearbox. The propeller shaft runs in a steel tube which terminates, at its forward end, in a steel yoke which serves to attach the tube to the frame of the car and takes the thrust of the drive. The rear axle housing is extremely heavy and the shafts run in double ball bearings. As befits a powerful car, the braking surface is large, the drums being 16 inches in diameter and 2½ inches wide. The front axle is of the usual I-beam section, a single piece steel forging.

The wheelbase is 130 inches, which is amply long to give easy riding, in conjunction with the semi-elliptic front and three-quarter elliptic rear springs. The 36-inch wheels are shod with 4½-inch tires on demountable rims; the make of tire is optional. The Warren car is well provided with the various and sundry things that usually are grouped under the head of equipment. There is a silk mohair top, with "Jiffy" side curtains and top boot, a ventilated one-piece windshield, an extra demountable rim, tire irons on the back of the car, complete electric lighting and motor starting equipment, with generator and storage battery, Yale lock for the control levers, electric horn and speedometer.

The popular black and nickel metal trimmings are used throughout the new "six," and in the matter of painting a number of colors are given as options.

Washington Witnesses Turnout of Trucks.

Variations in decorative schemes ranging through all stages from the almost sublime to the wholly ridiculous were in evidence on a goodly portion of the 300 odd commercial motor vehicles which on Monday last, September 3rd, went on "dress parade" over about five miles of Washington's most populous streets. The state of sublimity, however, was largely a matter of choice and naturally depended upon the age and temperament of the spectator. To the older folk it perhaps was best exemplified by the exhibit of G. M. Barker, a local real estate broker, which consisted of a diminutive bungalow mounted on a Wilcox truck and surrounded by just sufficient landscape to set it off to the fullest extent. The essence of sublimity, from the young "bach's" standpoint, at any rate, was carried by several taxicabs operated by the Federal Taxicab Co., in the forms and faces of a number of well-gowned girls, although some few favored the electric truck of the Potomac Telephone Co., upon which was mounted a regulation switchboard and operated by one of the attractive "hello" staff. All were agreed, however, that in point of ridiculousness a Capital truck operated by the Calvert Feather Co., and topped by a huge and ever-crowing chanticleer deserved the palm.

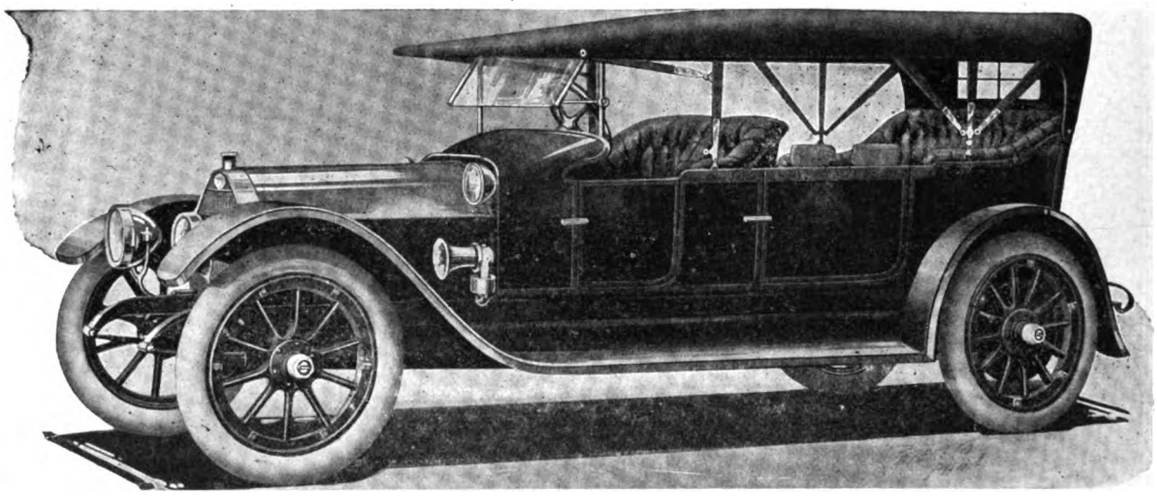
The parade, which was started at Scott Circle at 1 P. M. and which was finished at the same place three hours later, was run in two divisions under the auspices of the Washington Post. In the first division were the cars which were decorated, and in which an even hundred vehicles contended for the five money prizes which were offered. First money went to Gude Bros. & Co., who entered a Stewart truck decorated wtih the late summer's floral offerings, Barker's bungalow bearing a Wilcox took second prize and third was won by the Chanticleer. A Wilcox entered by the Old Dutch Market and bearing a windmill took fourth prize and the "small change" went to the "King 'Coal'" Witt-Will truck entered by W. W. Griffith. In the nondecorated division, in which 200 odd cars were entered, the three prizes offered were awarded to a Ford entered by Garfinkle & Co., a second entered by the Arlington Mills, and a Little Giant wagon entered by the Motor Truck Corporation, respectively. The Wilcox Truck Co., with a total of 37 vehicles, won the cup offered for the greatest number of machines entered; consolation cup went to the Studebaker Corporation, which had 21 vehicles in line.

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TOURAINE "SIX" MAKES ITS DEBUT

Made in Philadelphia for New York Firm, It Proves an Appealing Creation— Its Chief Characteristics.

In developing the Touraine "six," which is the very newest of the six-cylinder products to invade the field, it has been the object of the designers and manufacturers to produce a vehicle of genuine merit which could be sold at a figure that would place it at once in the moderate-priced and high-grade classes. Apparently no pains have been spared to make the car all it should be from the purchasers' point of view, and the price—$2,950—including, as it does, equipment that is complete in the true sense of the word, almost speaks for itself.



TOURAINE, THE MOST RECENT ADDITION TO THE INCREASING FAMILY OF "SIXES," AND WHICH SELLS FOR $2950

The car itself is produced by the Nance Motor Car Co. of Philadelphia, Pa., and though in one or two respects it resembles the car that bears the Nance nameplate, great stress is laid on the fact that it is an entirely different and distinct model that has been created, especially for S. J. Wise & Co., of New York City, former Amplex distributers for the Metropolitan district, which company has arranged to market the entire output.

In working out the design of the new car, accessibility coupled with that degree of rigidity which has been found best have been made the keynotes, though in no single instance has the necessity for simplicity been overlooked. By way of reducing the number of parts in the motor to the minimum without sacrificing the desirable features inherent in the easily disassembled power plant, the cylinders are cast in two sets of threes, the valves being located on either side in liberal sized pockets which provide means whereby the homogeneity of the mixture before finally entering the cylinders is ensured. The valve head pockets are carefully water-jacketed to obviate the possibility of distortion by reason of heat, and the valve mechanism is completely enclosed by means of light, removable metal covers which are held in place by thumbscrews.

Having in view the tendency toward long strokes and the advantages of this method of construction, the stroke has been made 5½ inches as against 4 inches bore, the rating of 40 to 50 horsepower therefore being conservative. Excessive power development, however, is not claimed for the motor, attention having been centered rather on the production of an engine in which the accelerative powers should predominate. Still, the actual power development is well in excess of the rating, and by reason of the large valves and long stroke, the power of acceleration leaves little to be desired. Giving evidence of the capacity of the motor, it is pointed out that at 2,200 revolutions a minute 61 brake horsepower is generated. Ignition is effected by high tension magneto, the Bosch dual system with a single set of plugs being employed. The lubrication system is of the constant level splash type, the oil being circulated by means of a gear pump within the crankcase. Cooling is by water, with a gear driven centrifugal pump and a honeycomb type radiator.

From the engine, power is transmitter to the full-floating rear axles through the intermediary of a multiple disk clutch in which the alternate disks are faced with Raybestos. The clutch runs in an oil bath, which augments its smooth action. The change gear mechanism is of the sliding gear type and provides three speeds forward and reverse. The operation is selective by means of the orthodox H quadrant with the gear shift lever conveniently placed at the operator's right hand. By way of reducing the labor of driving, the radius of action of the lever has been limited to the smallest possible amount.

In the remainder of the transmission elements, considerable ingenuity is evident in the construction and disposition of the parts. For instance, there are no torque rods and, though the torque is absorbed by means of a torque tube which encloses the propeller shaft, the method of attaching the tube to the chassis is quite different from anything else of its kind that obtains. The rear end of the tube, of course, is securely bolted to the differential housing. The front end, however, is supported in an unusual type of yoke which, in addition to permitting radial action of the rear axle, also permits a certain amount of frame weaving without transmitting the movement to the chassis frame. Incidentally, it permits of one of the rear wheels being raised considerably higher than the other, as would be the case when an obstruction in the road is encountered, or when one wheel drops into a hole. But a single universal joint enters into the rear construction.

Following standard practice in this respect, the front springs are of the semi-elliptic variety; they are 37 inches in length and have been designated with the view of eliminating the necessity for shock absorbers. The rear springs are three-quarter elliptic in form and measure 56 inches in length. Two sets of brakes are provided, both sets being located on rear wheel drums. The service brakes are internal expanding, operated by means of a pedal, and the emergency set is external contracting and equalized, operated by means of the usual side hand lever. The steering gear is of the worm and nut type and is calculated to permit rapid movement of the road wheels with the minimum movement of the hand wheel and the least possible exertion on the part of the driver The wheelbase of the car may be either 124 inches or 134 inches, according to the requirement or desire of the purchaser.

As already has been mentioned, the equipment is complete and includes a Gray & Davis dynamo electric lighting system, mohair cape cart top, swinging glass windshield, speedometer, Klaxon horn, demountable rims, spare tire carriers, full complement of electric head, side, tail and dash lamps, robe rail, foot rail and the usual assortment of tools, spare parts, tire repair kit and so forth.

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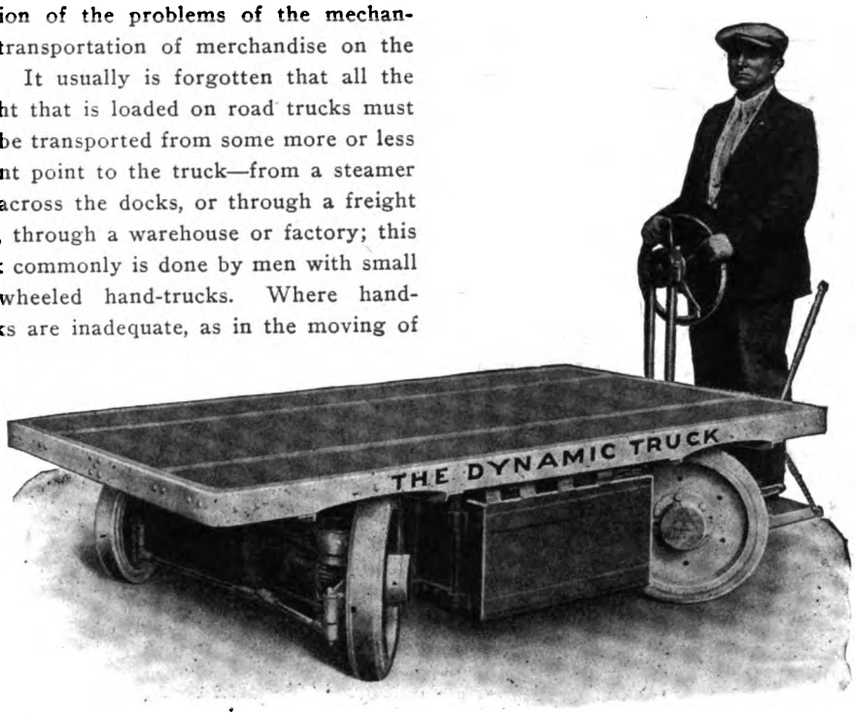
MOTOR TRUCKS FOR INDOOR SERVICE

Displacing Laborers and Hand-Trucks With Four-Wheel Drive Electrics—Automatic Brakes and Control System.

There is one problem in connection with the handling of freight that has been kept very much in the background, doubtless because of the interest that is taken in the solution of the problems of the mechanical transportation of merchandise on the road. It usually is forgotten that all the freight that is loaded on road trucks must first be transported from some more or less distant point to the truck—from a steamer and across the docks, or through a freight shed, through a warehouse or factory; this work commonly is done by men with small two-wheeled hand-trucks. Where hand-trucks are inadequate, as in the moving of baggage at railroad stations, in handling material in factories and the like, recourse is had to larger three-wheeled or four-wheeled trucks, also pushed by laborers. In fact, a very large proportion of all the freight that is transported must at one time or another be moved in one of these ways. The amount of time that is lost by adherence to time-honored—that is to say, antiquated—methods is of course very large, and apparently the railroad people were the first to appreciate the fact, as is indicated by the growing use of power trucks for the transportation of baggage on station platforms. This, however, is merely one corner of the field, so to speak, and there are almost unlimited possibilities for small power trucks capable of taking the place of hand trucks, just as motor cars are fast taking the place of horses and wagons for road work.

Realization of these facts brought about the formation of the Cleveland-Galion Motor Truck Co., of Cleveland, O., as told several weeks since in Motor World, for the manufacture of the "Dynamic" electric truck, designed solely for use in factories and warehouses and on docks and in freight sheds, where large quantities of freight have to be handled by men under present conditions. The machine is of special design throughout, down to the last bolt and nut. To the brief description of the vehicle that already has been printed in Motor World it now is possible to add details which indicate the care taken in working out the design, as well as the appropriateness of the design to the work to be done.

The Dynamic truck is an electric, employing a storage battery as the source of current for its single motor, and all four wheels are driven and steered. The four-wheel drive is of importance in giving the traction necessary to climb the excessively stiff grades that are encountered on ships' gangplanks, on inclines leading up to platforms and the like. The four-wheel steer is practically indispensable in maneuvering in crowded warehouses and freight sheds and on shipboard.



DYNAMIC WAREHOUSE TRUCK, SHOWING METHOD OF CONTROL

Not the least interesting of the mechanical features of the new truck system is the system by which power is transmitted from the centrally located electric motor to the four wheels. The plan view shows the location of the motor and of the two propeller shafts, coupled by means of universal joints to the ends of the armature shaft, and the general lay-out of the truck, with the battery divided into two sections carried on either side of the chassis. The sectional view of an axle and wheel shows the driving mechanism in detail.

The propeller shafts drive live axles which do not differ materially from the live axles commonly used in motor car construction, though there is a touch of the unusual in the employment of worm drive from the shaft to the axle. The differential is of the familiar bevel gear type and there is one in each axle—in fact, both axles are exactly alike in every particular. The final drive to the wheels, however, is particularly interesting because it is the crucial point in the working out of a four-wheel drive machine.

Each live shaft carries at its outer or wheel end a bevel pinion which meshes with a similar gear carried on a vertical shaft. An upward extension of the vertical shaft carries a second bevel which meshes with a large bevel gear bolted direct to the wheel, which is of the disk type. Thus the axle shaft rotates the vertical shaft and the vertical shaft, through the bevels, turns the wheels. The practicability of the whole arrangement is dependent upon the fact that the axis upon which the vertical driving shaft rotates is, at the same time, the axis upon which the wheel turns in steering—in other words, it is the steering pivot, practically. Therefore the drive is just as efficient when the wheel is thrown around to the extreme limit of its movement as it is when pointed straight ahead, because there is absolutely no change in the conditions of power transmission.

All the driving mechanism is enclosed in an oil-tight casing which also serves to carry the supporting bearings for the shafts. All gearing runs in oil. Hess-Bright ball bearings are fitted throughout. There is an ingenious little idea embodied in the bevel gear drive that is deserving of mention. At the extreme outer end of the axle shaft there is a hardened steel cone which may be called an extension of the bevel gear, but is without teeth, the surface being perfectly smooth. A similar cone is mounted on the vertical shaft, just below the corresponding bevel. The two cones roll upon each other, and are so calculated with reference to size and position that when they are in contact the gears are meshed to exactly the right depth. Thus the teeth cannot possibly mesh too deeply, and any slight tendency of the vertical shaft to drop is counteracted.

The controlling mechanism of the little truck is not the least interesting of its details. The brakes, one of which is shown in the illustration of the axle, operate on drums carried by the driving shafts. Contrary to the usual practice, the brakes normally are set, and can be released only by pressure on the controlling pedal. If for any reason the driver leaves the truck the brakes, of course, act automatically. At the same time the current is cut off from the motor, and, no matter what position the controller handle may be in, the truck cannot again be started until the handle is brought back to the neutral or "off" position. The controller is similar, so far as its effects are concerned, to the so-called "dead man's controller" in use on electric trains.

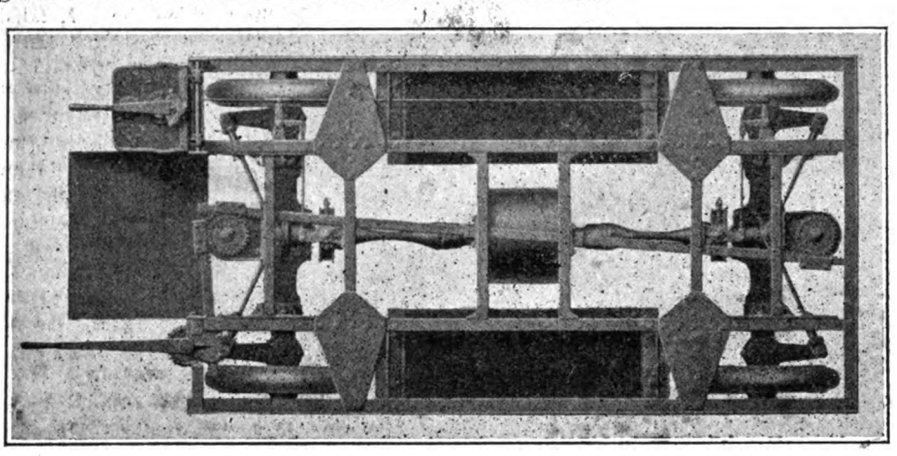
In anticipation of the fact that the trucks undoubtedly will be overloaded and that they will be required to climb, with their loads, some grades that can be called nothing short of precipitous—such, for instance, as may be found on a ship's gangplank when the tide is low and the pier high—a planetary gear has been added to the driving system, which will give enormous

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power at slow speed for such abnormal conditions. Such a gear is useful also under ordinary hill climbing conditions in that it permits the motor to run at its normal and therefore economical speed, and in this way saves a very considerable amount of current. The battery also is much benefited by the gearing for the reason that a fast-running motor draws much less heavily upon the battery than the same motor running slowly, and a battery that is discharged at its normal rate will give a greater output per charge and will have a longer life than if the current is drawn at an abnormal rate, even though the total number of ampere-hours used may be exactly the same. The steering gear is of the worm and sector type and irreversible, in which respect it differs from the gear shown in the illustration of the chassis, in which the early rack-and-pinion mechanism is shown. The planetary gear also was added since the construction of the chassis illustrated. It is completely housed in a steel casing which also encloses the motor, and both gearing and motor are thoroughly protected from the intrusion of dust and lubrication is effected under the most favorable conditions.

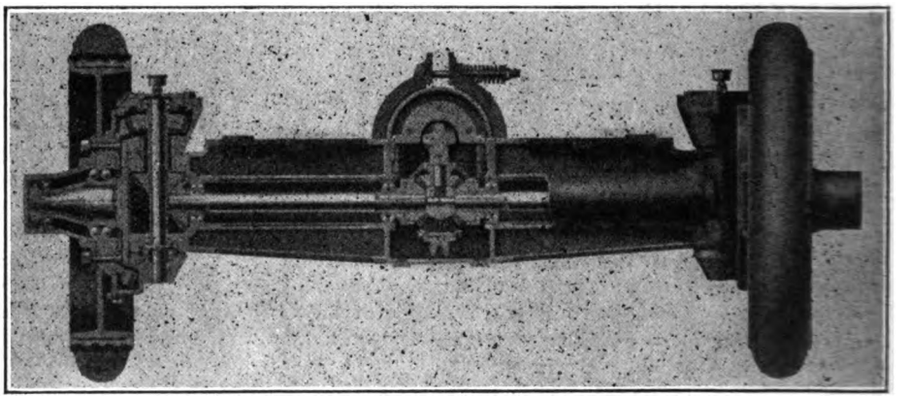
The driver stands, while running the machine, on a low platform at one end of the machine, and can drive backward and forward with equal facility. The new trucks now going through the factory have vertical steering wheels, and the controllers, of new and special design, placed out of sight and out of the way, though readily accessible in case of necessity. The 40-cell 120-ampere hour lead plate battery is carried in two steel cases, which are suspended on springs and also provided with rubber buffers, so that any excessive rebound is cushioned, all of which has an important effect in prolonging the life of the plates.

For convenience of operation in the confined spaces where the Dynamic truck is intended to work, the tread is made narrow, the standard width being 36 inches. The frame and platform overhang the wheels, which thus are protected, as the platform itself would first strike a pile of freight, for instance, or a door-post, in case the driver steered a little too "fine." The wheels are shod with solid rubber tires. Although the Dynamic truck is built in but one capacity —namely, two tons—it is built in two tread widths; the standard, 36 inches, and the narrow tread, 27 inches, the latter intended for use where the passageways are exceptionally narrow. Platform widths vary from 34 to 45 inches, while platform lengths may be made to suit the work in hand, the length being optional within reasonable limits. With the planetary transmission, there are six available speeds, varying from half a mile an hour to six miles an hour.



BIRDS-EYE VIEW OF DYNAMIC CHASSIS WITH DIVIDED BATTERY

A special model is being built for rolling-mill service, and this will be in the nature of a tractor, the steering arrangements of which will be particularly interesting, inasmuch as it will be possible to use the tractor either to push or to pull its trailers, while steering the whole train with equal facility in either direction.



WHEELS AND DRIVING AXLE, PARTLY SECTIONED, SHOWING DRIVE

When Lamp Oil Kept the Engine Going.

When the fuel tank runs dry miles from nowhere, the problem is a pretty one which, on occasion, has given rise to ingenious exercise of mother wit. More than once the illuminating gas in the Prest-O-Lite tank has bridged the gap, so to speak, but recently, when E. F. Lesselyong, of Ironwood, Mich., ran dry he was in a dense forest four miles from home, and as the night was pitch dark he needed the acetylene gas to light his way. As a result of quick thinking, however, he transferred the kerosene from his oil lamps on his Kissel car into the fuel tank and, as it was done while the engine still was hot, he reached home expeditiously.

Plating to Assist Case-Hardening.

There are many steel parts used in machine construction that require case-hardening, but which can be handled to much better advantage during manufacture if the case-hardening process is confined to the surfaces where there is frictional contact with other parts—for instance, to the teeth, in the case of a gear. As it is necessary, however, in the carbonizing process to pack the whole gear in the carbonizing material and subject it to heat, the problem is to prevent the absorption of carbon by the parts that do not require hardening. One way of accomplishing the desired result is to copper-plate all except the parts to be hardened, or else to plate the whole gear before the final cut is taken from the gear teeth, which, of course, amounts to the same thing in the end, as the teeth only are left without the copper coating. The carbon will not penetrate the copper, and when the metal is subsequently "quenched" only the unprotected parts, which have been carbonized, will harden. The process is by no means a new one, having been in use for many years in the manufacture of bicycle parts. An axle can be hardened all over except on the threads, and where there are ball races on the axle they can be hardened and the rest of the axle left soft.

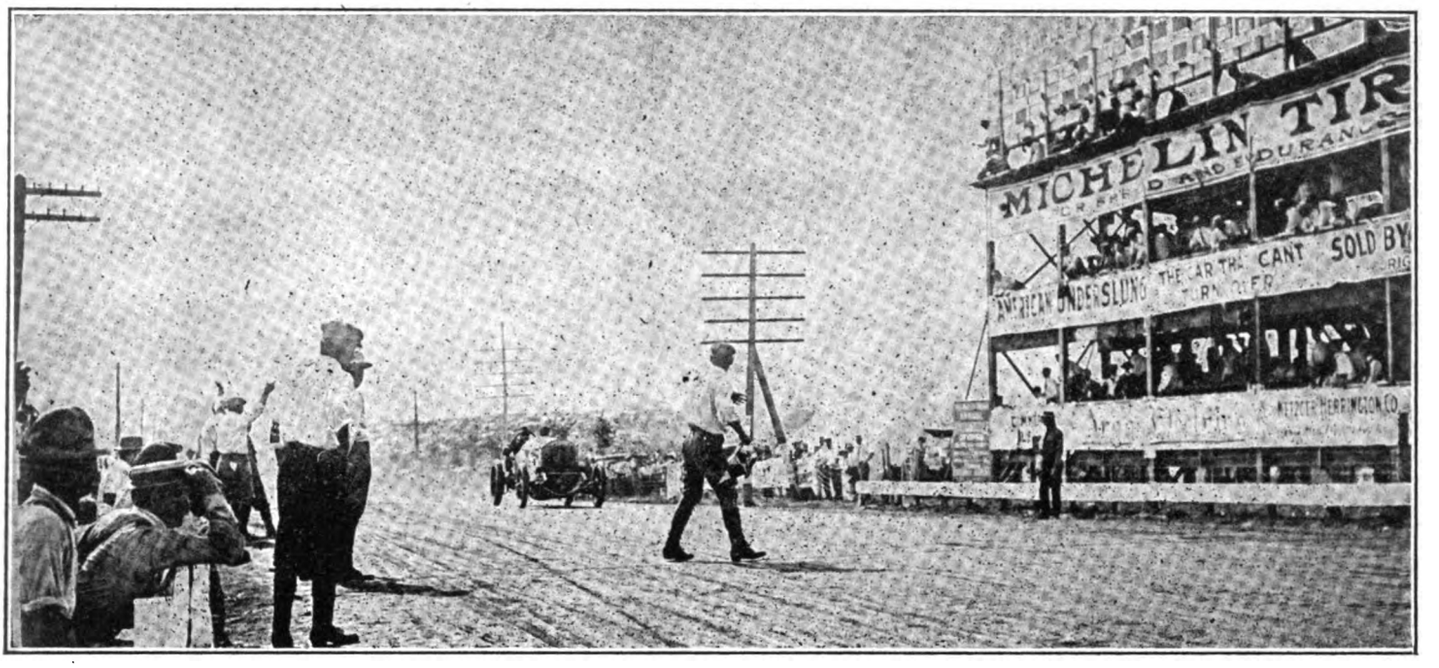
To Render Parts Luminous in Dark.

By mixing pulverized phosphorescent material, such as sulphide of calcium, phosphoretted zinc or sulphide of barium, together with a trace of bismuth, with a binding material, such as gelatine, lac, gelose, etc., a paint or gouache (water color body) is obtained which may be used for rendering any part of an automobile luminous in the dark, provided it has been exposed to the rays of light or heat previously. It may be varnished over or not, and it is not affected by rain or weather. The color may be any one desired.

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RALPH DE PALMA VICTOR IN DOUBLE EVENT AT ELGIN

After a Long Siege of Hard Luck the New Yorker Overthrows His Jinx and Wins Chief Honors in Fast Time – Bergdoll Blazes Way in Free-for-All but Loses Speed in Closing Rounds – Merz, Hughes and Endicott Account for Minor Races.



DE PALMA RECEIVING THE CHECKERED FLAG AT THE FINISH OF THE FREE-FOR-ALL

For events which once had been abandoned because of lack of interest and entries, only to be "rescued" by the Chicago Automobile Club, the Elgin road races, on Friday and Saturday last, bore no semblance to abandoned waifs. They were the "real things," even though the fields were not large. And Dame Fortune, too, at last smiled upon Ralph De Palma. As those who have to do with motor cars, and especielly racing cars, may know, the smile was slightly belated, but it nevertheless was a "winning" smile, and a double winner at that, for the clever New York Italian cleaned up not only the Elgin National Trophy road race, which was run on Saturday last, August 31st, at Elgin, Ill., but also the somewhat longer Free-for-all, which was run concurrently.

De Palma's victories both were well earned, as Ralph Mulford in the Knox "six" gave him a good fight and wrested the lead from him several times before the 254 miles all were reeled off; but De Palma, who handled a Mercedes, occupied the premier position at the finish of all save five of the 30 laps, and at the end of one of the five he was on even terms with Mulford, his only really serious contender. In the Free-for-all he had an even sterner battle, for Erwin Bergdoll showed the way in the Benz car for practically the entire flight of 305 miles and better, only to be nosed out at the last moment, so to speak, by De Palma.

In the so-called minor events which were run simultaneously on Friday and which constituted a curtain-raiser for the big program of the day following, Charles Merz won the Illinois trophy, completing the 24 laps of the circuit at an average rate of 66.11 miles an hour in a Stutz car. Hughey Hughes, in a Mercer, annexed the Aurora prize by sovering the 152 miles in 2 hours 20 minutes 40.11 seconds, and Harry Endicott, in a Mason Special, won a hollow victory when he took the Jencks trophy for the "baby" car event, finishing all alone the 101 miles in 1 hour 40 minutes 42.9 seconds.

Speed naturally was to be expected over a circuit just a shade longer than 8¼ miles, upon which had been bestowed all the attention that the joint promoters of the race —the Chicago Automobile Club and the Elgin National Road Race Association— were empowered to bestow, but though speed such as the Elgin course never before has witnessed was evhibited and all former Elgin road records were eclipsed, in view of the fact that for the first time the Elgin events were open to cars built specially for racing purposes the speed was in no wise phenomenal. The best average speed made in any of the five events logically was made by De Palma, who completed the 305 miles 204 feet in the Free-for-all in 4 hours 15 minutes 36.25 seconds, which figures out exactly 70 miles an hour, which is 4.58 miles an hour better than the best time made by Zengle in a National stock car last year, when De Palma lasted exactly one lap. De Palma's average speed for the shorter event, strangs enough, was less than in the longer race and stands at 68.04 miles an hour, it having taken him 3 hours 43 minutes 20.6 seconds to cover the 254 miles 1,050 feet. The best time for a single lap—6 minutes 51 seconds—was made by Bergdoll and was considerably better than the record made by Mulford in a Lozier last year, when he rounded the circuit in 7 minutes and 13 seconds.

The roads approached more nearly that "pink of perfection state" than was the case last year; the oil which had been applied at a period sufficiently far in advance of the start of the race and which furthermore had been worked in by the ceaseless travel of the wheels of the numerous contenders who were on the field warming up their mounts even so far as a fortnight before the start, had been so well absorbed as to fully have served its purpose. The usual fences shutting off the bordering farms had been re-positioned, the sharp points eased off and the wrinkles rolled out—in fact, the course was put in prime condition.

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As if to justify the act of the Chicago Automobile Club, which at the eleventh hour had undertaken the management of the two-day speed carnival, by their unwonted display of interest, a great crowd of enthusiastic spectators filled the grandstand and lined the course. Perfect order was at all times preserved by a very efficient guard furnished by the Illinois State militia, assisted by local deputy sheriffs.

Throughout the two days, no fatality or no accident of a really serious nature occurred, although ambulances were called on several occasions. The most serious mishap occurred when George Clark piloted his Mercedes through a fence at the beginning of the sixth lap of the Elgin National Trophy race. The accident occurred at the Hornbeck's turn, and both Clark and his mechanician, Malone, were precipitated for a considerable distance in front of the machine. It first appeared as if Clark's skull were fractured, but it developed at the hospital, to which both were removed, that neither man was suffering from injuries more serious than severe cuts and shocks. After finishing second in the Elgin Trophy race and while pressing on for the Free-for-all purse, Ralph Mulford fainted and William Chandler, his mechanician, who once before, when Mulford had been disabled by a flying stone in the Santa Monica (Cal.) road race, had done similar duty, slipped into the driver's place and brought the Knox into third place in the Free-for-all. Mulford was removed to a hospital, where he quickly recovered.

The usual round of preliminary bombs which signaled to the road guards to clear

Summary of the Elgin Road Races, August 30 and 31, 1912.

FOR THE ELGIN NATIONAL TROPHY, 254 MILES, AND THE FREE-FOR-ALL, 305 MILES.

Pos.	Driver and Car	1 8 miles 2499 feet	5 42 miles 1935 feet	10 84 miles 3870 feet	15 127 miles 525 feet	20 169 miles 2460 feet	25 211 miles 4395 feet	30 254 miles 1050 feet	Average Speed	FREE-FOR-ALL 31 262 miles 3549 feet	35 296 miles 2985 feet	36 305 miles 204 feet	Average Speed	Pos.
1	Ralph DePalma, Mercedes	7:00	36:01	73:32	110:12	145:32	183:46	223:20.06	68.04	230:23	258:47	265:36.25	70.00	1
	*Erwin Bergdoll, Benz	7:09	34:57	70:10	105:22	144:14	183:14	219:04		226:25	259:26	270:28.25	67.5	2
2	Ralph Mulford, Knox	7:15	36:08	73:55	112:59	150:32	185:46	226:09.26	67.03	233:28	266:14	274:08.72	66.6	3
3	Charles Merz, Stutz	7:51	38:12	76:27	121:30	160:08	198:30	236:43.50	64.4					
4	M. Roberts, Mason Special	8:03	39:42	80:28	119:39	160:08	199:07	238:17.00						
5	Gil Anderson, Stutz	7:51	38:16	75:54	113:24	153:29	199:24	239:57.60						
6	Eddie Herne, Fiat	7:52	39:07	75:50	124:05	162:23	200:48	Out 26th lap. Broken gear. Time, 212:27						
7	Spencer Wishart, Mercer	8:07	39:40	77:43	116:02	155:10	Out 24th lap. Broken oil pipe. Time, 226:59							
8	Hughie Hughes, Mercer	7:36	39:38	76:41	115:23	Out 17th lap. Burned out connecting rod bearing. Time, 131:39								
9	George Clark, Mercedes	9:25	38:59	Out 5th lap. Broken rear wheel										

* Competed only in Free-for-all.

FOR THE ILLINOIS TROPHY, 203 MILES, FOR CARS OF 301-450 INCHES DISPLACEMENT.

Pos.	Driver and Car	Equipment: Tires	Magneto	Carburetter	1 8 miles 2499 feet	5 42 miles 1935	10 84 miles 3870 feet	15 127 miles 525 feet	20 169 miles 2460 feet	24 203 miles 1896 feet	Average Speed
1	Charles Merz, Stutz	Michelin	Splitdorf	Schebler	7:04	37:48	75:38	114:59	153:40	184:32.25	66:11
2	Gil Anderson, Stutz	Michelin	Mea	Rayfield	8:00	38:54	76:56	116:26	155:36	186:14.15	
3	Neil Whalen, National	Michelin	Splitdorf	Schebler	7:46	38:21	Out 9th lap. Broken magneto pin.				
4	W. Hobbs, Rayfield	Michelin	Mea	Rayfield	8:35	Out 2nd lap. Broken main bearing.					

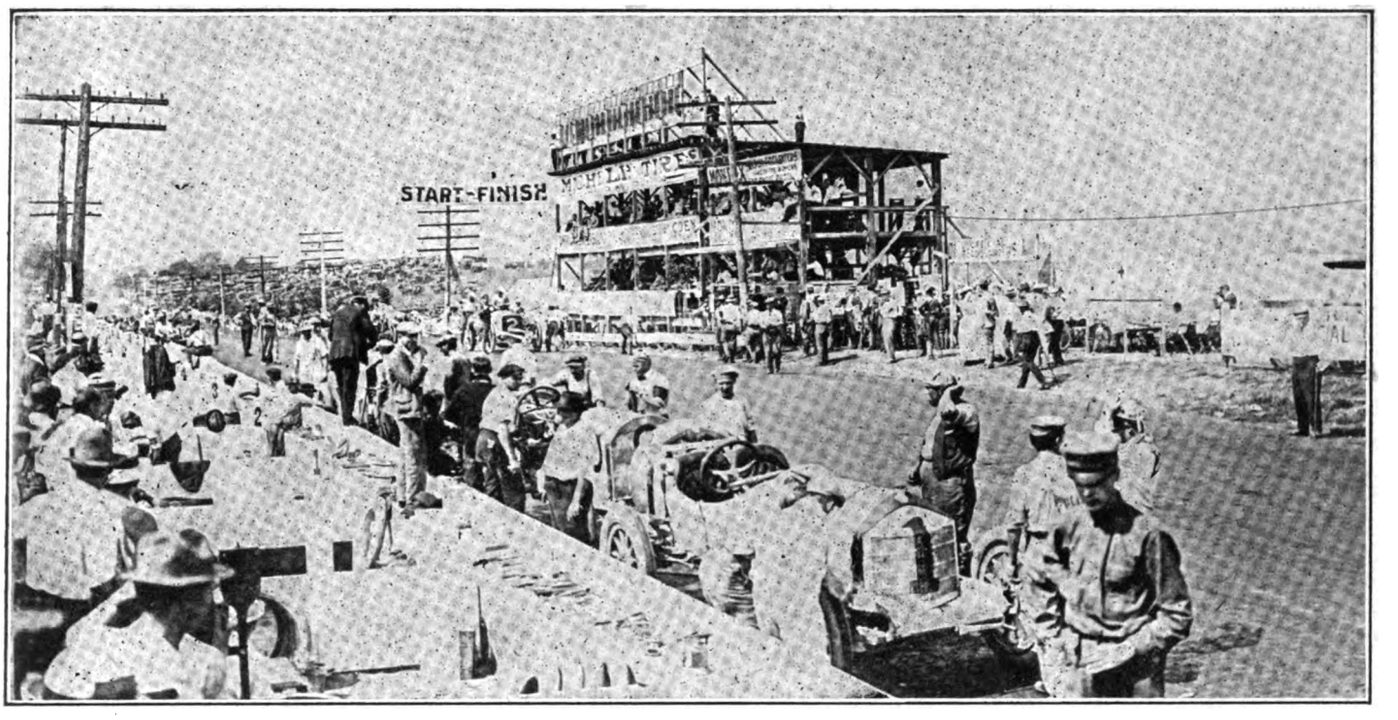
FOR THE AURORA TROPHY, 152 MILES, FOR CARS OF 231-300 INCHES DISPLACEMENT.

Pos.	Driver and Car	Equipment: Tires	Magneto	Carburetter	1 8 miles 2499 feet	5 42 miles 1935 feet	10 84 miles 3870 feet	15 127 miles 525 feet	18 152 miles 2742 feet	Average Speed
1	Hughie Hughes, Mercer	Firestone Prowodnik	Bosch	Rayfield	7:52	38:33	77:58	117:57	140:40.11	65.04
2	N. Pullen, Mercer	Michelin	Splitdorf	Rayfield	8:21	40:05	80:28	122:09	146:31.45	
3	H. Trussel, Fal	Michelin	Splitdorf	Schebler	9:28	50:44	96:44	142:18	169:19.30	
4	M. Roberts, Mason	Michelin	Splitdorf	Rayfield	8:36	47:41	88:47	141:12	178:11.74	
5	H. Hastings, Fal	Michelin	Splitdorf	Rayfield	10:15	50:47	105:19	154:43	183:57.53	
6	Spencer Wishart, Mercer	Firestone	Bosch	Rayfield	8:04	49:40	96:00	Out 13th lap.		

FOR THE JENCKS TROPHY, 101 MILES, FOR CARS OF 161-230 INCHES DISPLACEMENT.

Pos.	Driver and Car	Equipment: Tires	Magneto	Carburetter	1 8 miles 2499 feet	5 42 miles 1935 feet	10 84 miles 4153 feet	12 101 miles 3588 feet	Average Speed
1	H. Endicott, Mason Special	Michelin	Splitdorf	Schebler	8:05	40:42	83:24	100:42.90	60.57
2	F. W. Moe, Ford	Michelin	Ford	Kingston	12:15	66:13	Out 6th lap. Time, 87:28		
3	W. G. Wordingham, H'hoff	Michelin	Bosch	Rayfield	10:49	Out 1st lap. Broken rear Wheel.			

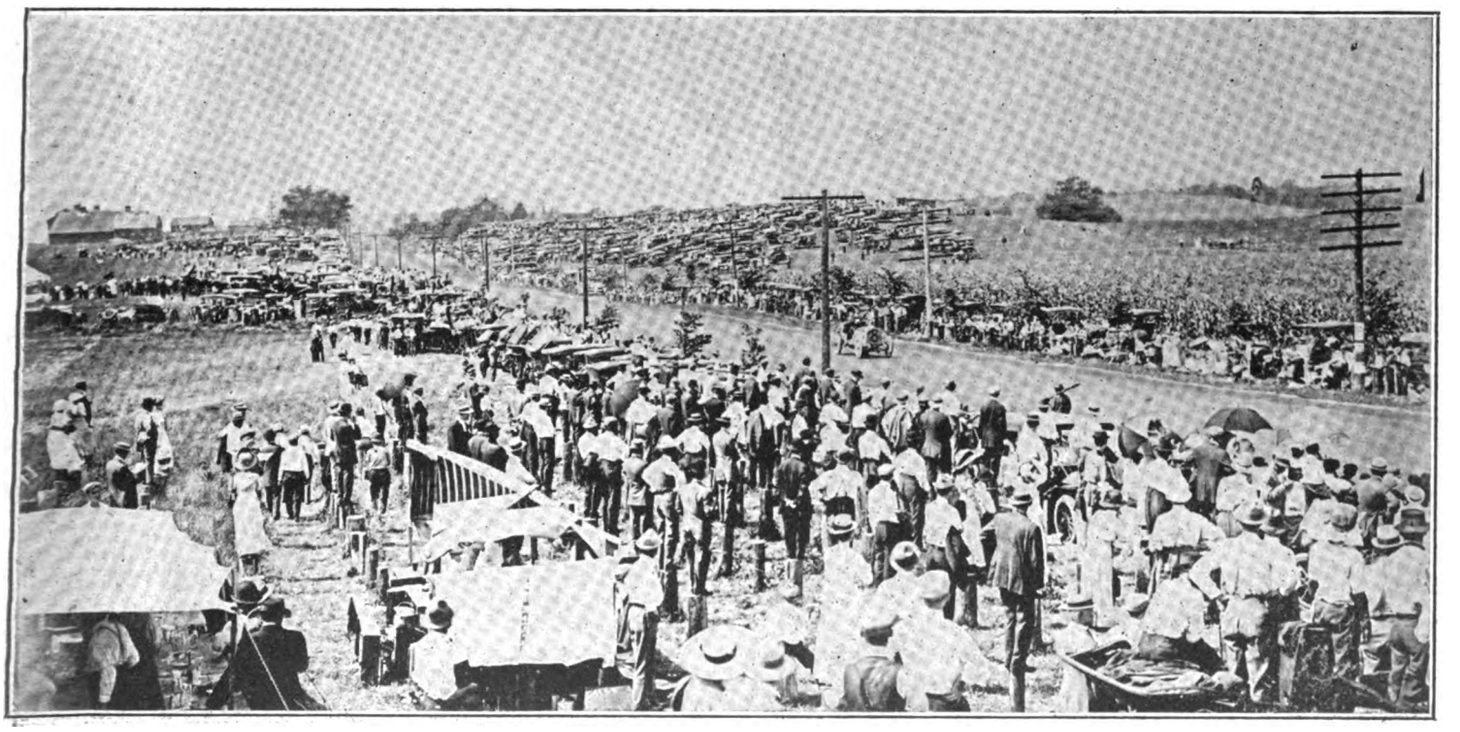
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GENERAL VIEW AT STARTING POINT; CARS AWAITING ELGIN TROPHY EVENT IN FRONT OF PITS

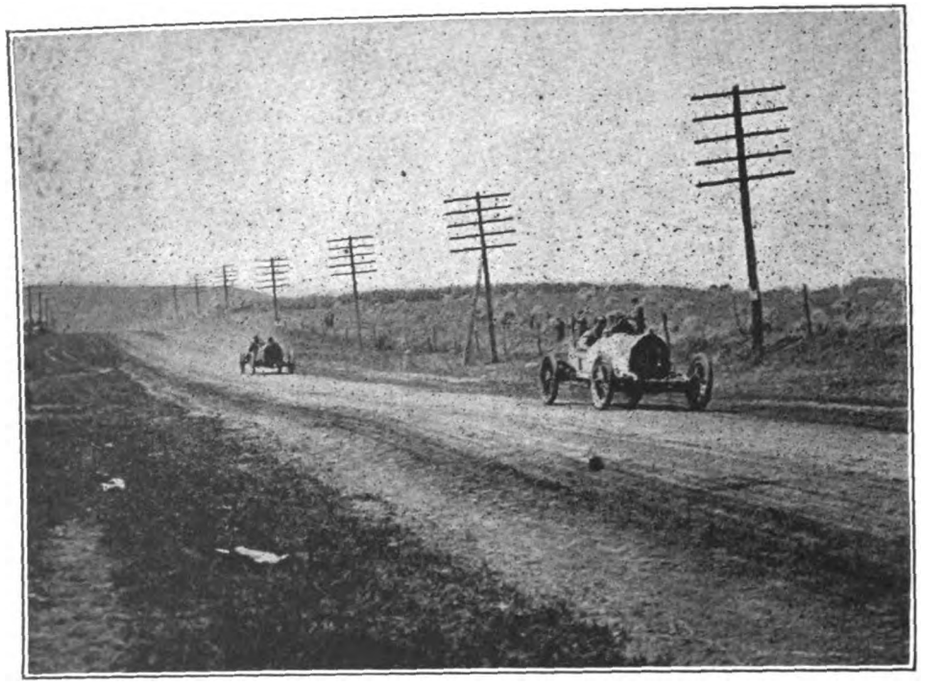
the course was set off promptly at 10.30 o'clock on Friday morning, and a single bomb which was fired after an interval of ten minutes announced to the spectators who were distributed around the course that the carnival had opened. Gil Anderson, in the Stutz car, was the first to get away of the thirteen who were lined up to compete, four for the Illinois Trophy, six for the Aurora Trophy and the remaining three for the Jencks Trophy; the others followed at 30 second intervals.

The Illinois Trophy race proved a Stutz affair from start to finish. Hobbs, who drove the Rayfield entry, was the first to retire, when he brought his mount to the pit at the close of the very first lap with a broken crankshaft bearing. Neil Whalen (National), who at the very outset had assumed the lead, maintained his position for two laps, when he gave way to Merz, who never was displaced. Whalen held second place until the end of the seventh lap, when he fell further, to third, and lasted but two more rounds, when he retired with a broken pin in his magneto coupling. The field was left to the two remaining Stutz drivers, and such was the consistency of the machines and the drivers that only once was the interval separating them greater than two minutes, and for the greater part of the race it was considerably less. Merz finished in first place, finishing the 203 miles in 3 hours 4 minutes 32.25 seconds, and Anderson crossed the tape just 1 minute 41.9 seconds later.

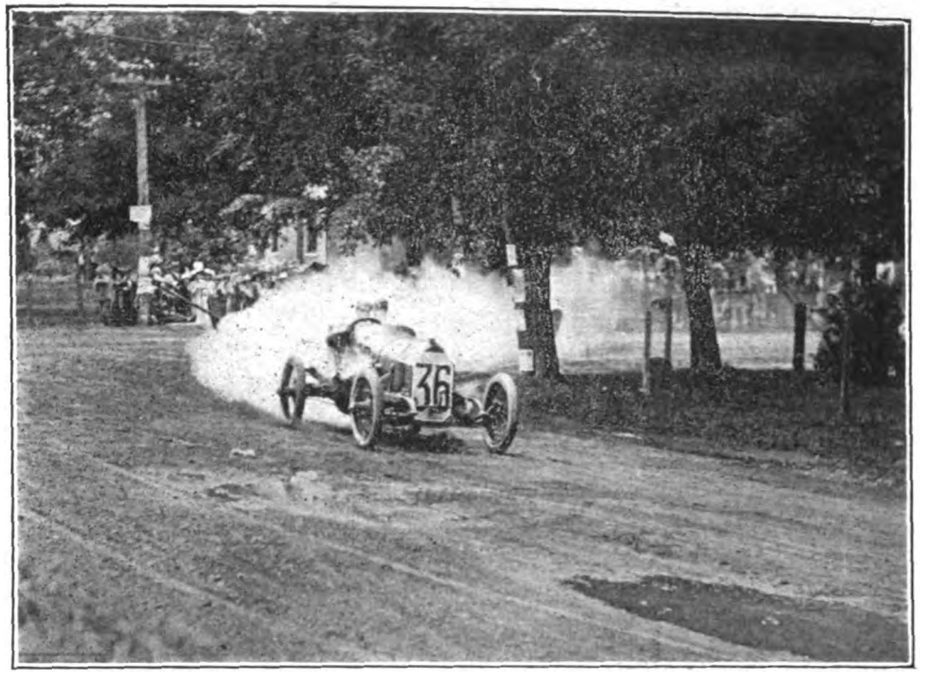


VIEW OF CROWD AND COUNTRY AND OF BERGDOLL (BENZ) "HITTING IT UP"

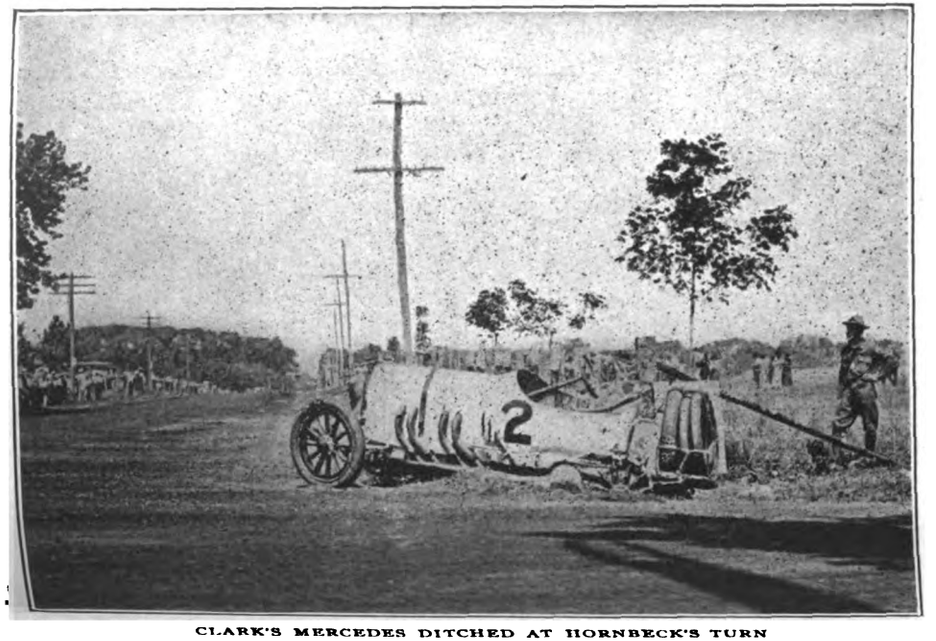
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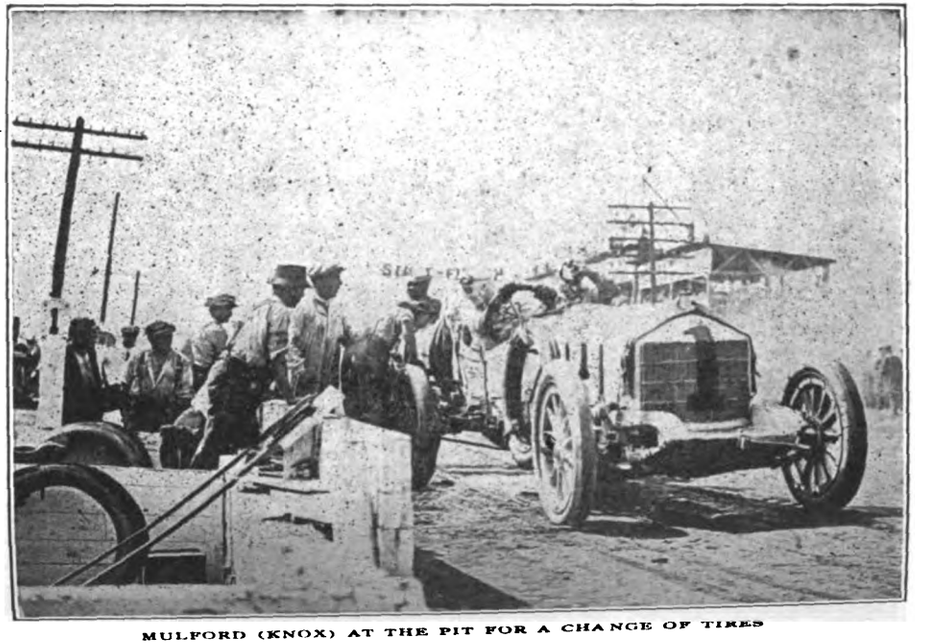
ENDICOTT (MASON) SHOWING MOE (FORD) THE WAY IN THE "BABY" EVENT



HUGHES AND HIS WIRE WHEELED MERCER ON McLEAN'S TURN



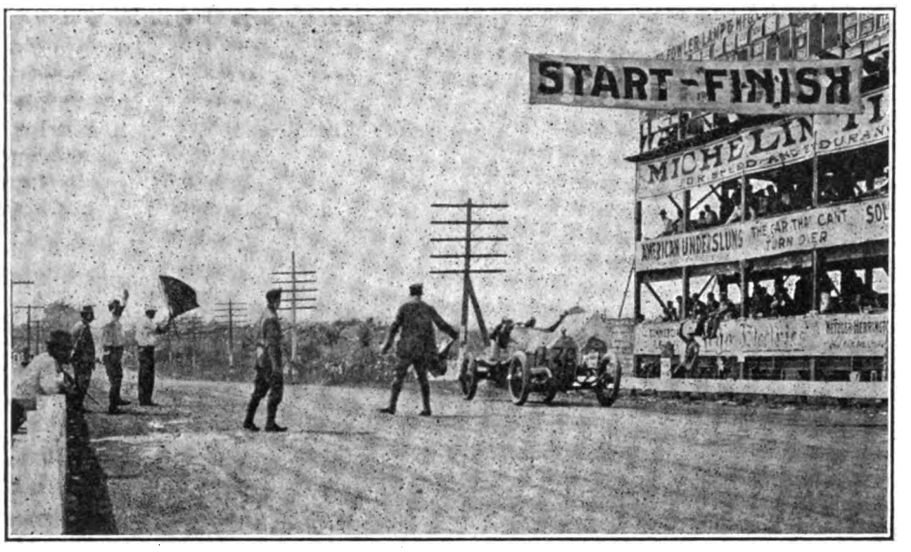
CLARK'S MERCEDES DITCHED AT HORNBECK'S TURN



MULFORD (KNOX) AT THE PIT FOR A CHANGE OF TIRES

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All of the six contenders for the Aurora Trophy, with the exception of Spencer Wishart (Mercer), who ran into a ditch when a steering knuckle broke on the 14th lap, were in at the finish. The race was "all Hughes" from end to end; there was not a single lap of the 18 run in which, with his wire-wheel Mercer, he was not in the lead. He finished over six minutes ahead of his team mate, N. Pullen, who completed the 153 miles in 1 hour 26 minutes 31.45 seconds. There was at no time the shadow of a doubt, always provided trouble did not arise, as to who would secure the place, for Pullen's lead over H. Trussel (Fal), who finished third, was even better than the interval which separated him from the winner. Fourth and fifth positions went to Mortimer Roberts (Mason) and H. Hastings (Fal), respectively.



HUGHES (MERCER) ACCOUNTING FOR THE AURORA TROPHY

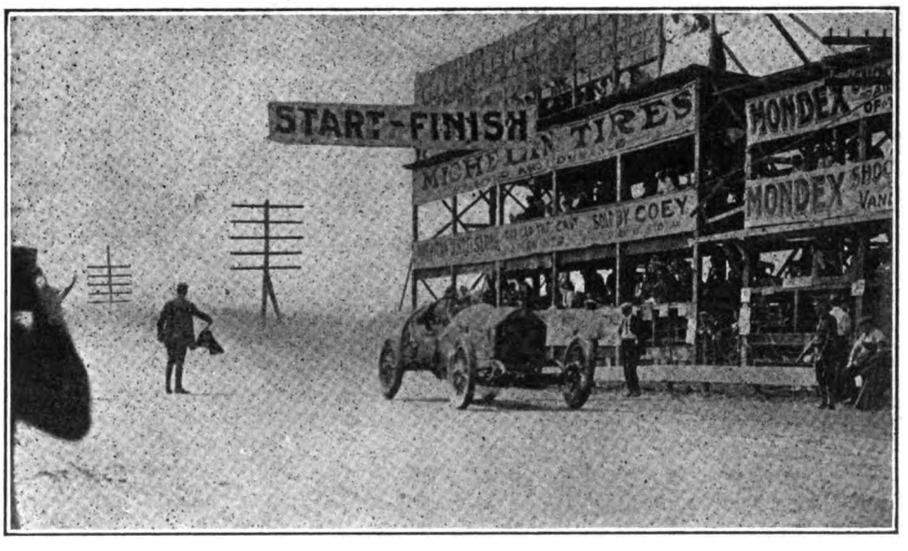
The "baby" car race for the Jencks trophy proved a hollow victory for Harry Endicott, who piloted a Mason Special; both of the other competitors, F. W. Moe (Ford) and W. G. Wordingham (Herreshoff), retired even before half the distance had been covered. Wordingham completed but a single round and retired with a broken rear wheel. Moe was on the seventh lap when his steering gear broke, and the car was ditched, but thanks to the hay mown in the adjoining fields, neither driver nor mechanician was hurt. Endicott completed the 101 miles at the average rate of 60.57 miles an hour.

All of the cars which competed in the races of the first day, with the exception of Wishart's Mercer, which was shod with Firestone tires all around, and Hughes's Mercer, which carried Firestones in the front and Prowodnik shoes in the rear, were equipped with Michelin shoes. But seven stops, all told, were made at the pits for replacements, and not all of the replacements were of tires. Both Endicott's Mason and Merz's Stutz, which were first in the races for the Jencks and the Illinois trophies, respectively, were fitted with Splitdorf magnetos and Schebler carburetters; the Mercer, with which Hughes won the Aurora Trophy, was fitted with a Bosch magneto and Rayfield carburetter and utilized Truffault-Hartford shock absorbers, with which Merz's mount also was equipped. The Mason used Mondexes.

Supplementing the "clear the road" bomb which punctured the atmosphere on Saturday morning, several couriers mounted on motorcycles circled the course to see that all was in readiness, and at exactly 11 o'clock the starting bomb was fired and Ralph Mulford was sent away, to be followed at 30 second intervals by the other nine contenders, all of whom save Erwin Bergdoll were contending in the Elgin trophy race. George Clark (Mercedes) went off after Mulford and the others followed in the following order: Mortimer Roberts (Mason Special), Ralph De Palma (Mercedes), Eddie Herne (Fiat), Gil Anderson (Stutz), Erwin Bergdoll (Benz), Charles Merz (Stutz), Spencer Wishart (Mercer), Hughie Hughes (Mercer). David Bruce-Brown, who was to have been a starter in the Free-for-all, driving a 120-horsepower Fiat, could not start because of a broken crankshaft, sustained in a practice spin. Neil Whalen also got into difficulties with his national and did not line up, and Teddy Tetzlaff, who by many was considered favorite, was at the eleventh hour replaced by Herne because of a disagreement as to tire equipment and contract. Both of the Fal cars which were to have been piloted by H. Hastings and G. Trussel were at the last moment withdrawn.

At the end of the first lap De Palma had a 15 seconds lead on Mulford, who, in turn, was 19 seconds ahead of Hughes in the Mercer. The other contenders for the Elgin trophy were pretty well strung out, with George Clark (Mercedes) bringing up the rear, 2 minutes and 10 seconds behind De Palma. Although the latter held the lead for the shorter event, he held only second place in the Free-for-all competition, Bergdoll having at once gone to the front, where he remained until the 23rd lap, after 194 miles and better had been covered.

Mulford forged ahead and showed up in first place in the Elgin competition at the end of the third lap, but De Palma had regained his lead before the fourth lap was completed. From that time on until the end of the 29th lap it was a case of see-saw between the Mercedes and the Knox pilots; Mulford showed up at the end of the sixth, 14th and 28th laps and was tied with the winner at the end of the eight, De Palma leading at all other times.



MERZ (STUTZ) WINNING THE ILLINOIS TROPHY

Third place rested first with Hughes, who held the position throughout four laps, only to be replaced during the fifth by Merz (Stutz). Merz and his team mate, Gil Anderson, were tied for third place at the end of the sixth, but Anderson forged ahead and assumed the position for the succeeding four laps, when Herne (Fiat)

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passed him. Tire trouble, encountered during the 14th lap, however, put back Herne into fourth place, and Anderson again took third position.

At the end of the 15th lap, when half of the 254 miles of the Elgin contest had been reeled off, the order was as follows:

1 De Palma (Mercedes
2 Mulford (Knox)
3 Anderson (Stutz)
4 Hughes (Mercer)
5 Wishart (Mercer)
6 Roberts (Mason)
7 Merz (Stutz)
8 Herne (Fiat)

But one driver, Clark, who piloted the Mercedes car which was ditched at the end of the fifth lap, was out of the running. As previously stated, Bergdoll in the Benz was well in the lead in the Free-for-all contest with De Palma second and Mulford third.

A burned out bearing put Hughes out of the running during the 18th lap, when he was in fourth place, and a broken oil duct, which had caused delay at the pit at the end of the 21st lap, similarly ended Spencer Wishart's flight as he was starting on his 25th lap. Wishart was in last place when he was forced to retire, having lost considerable time both at the pits and on the course, due to lubrication troubles. De Palma held his lead during 13 conescutive laps, from the 15th to the end of the 27th, when his right rear tire failed him, and although but very little time was lost in making the replacement, so close was Mulford pressing him that he passed the Mercedes pilot and assumed the lead, which, however, he held for only a single lap. Anderson remained in third only until the 25th lap, when Merz, who had been steadily creeping up, took the position and held it throughout the remaining six laps. Herne, who had been running last for several laps, retired at the conclusion of the 26th round with a broken gear.

De Palma regained the premier position from Mulford during the next to the last lap of the Elgin contest and finished that race nearly three minutes ahead of the Knox pilot, only to keep right on with the grind for the additional six rounds called for by the Free-for-all. Merz, in the Stutz, finished in 3 hours 56 minutes 43.5 seconds, over ten minutes behind Mulford, and Roberts crossed the tape two minutes later. Gil Anderson, the last man to finish, followed Roberts after an interval of a minute.

As was previously stated, Bergdoll had had things all his own way in the Free-for-all throughout the first 22 laps. When he stopped to take on oil and gasolene before proceeding with the 23rd circuit, however, De Palma closed the slight gap, and before the Benz driver again had taken to the road the Mercedes pilot was in front. His triumph was short lived, however, for the Philadelphian had again assumed the mastery before three laps had been completed; he, however, had lost some of his speed and was running about two minutes slower per lap, and as De Palma held steadily to his pace he wore down the Benz star and went ahead and to victory in the 35th round.

The strain of covering two and one-half centuries at a slightly better pace than 67 miles an hour had told on Mulford, and he broke down completely during the 31st round of the circuit. His place was taken by his mechanician, Chandler, who brought the car into third place. De Palma's lead over Bergdoll, which he had assumed during the 35th lap, was increased when Bergdoll pulled up at the pits at the end of the 35th lap with a flat rear tire, and thus enabled the winner to lengthen his lead by more than five minutes. Chandler brought the Knox over the tape nearly four minutes later.

Michelin tires shod the wheels of all five cars which completed the Elgin race, and Rayfield carburetters were included in the equipment of De Palma's Mercedes, Mulford's Knox, Roberts's Mason and Anderson's Stutz. Merz's Stutz was Scheblerequipped. As for magnetos, both De Palma and Mulford used Bosch instruments, Merz and Roberts Splitdorfs, and Anderson a Mea. Mercedes shock absorbers were on De Palma's winning car and Mondex on the Knox. Each of the other three cars to finish were Hartford equipped. Bergdoll's Benz was fitted with Fisk tires, a Benz carburetter, two Bosch magnetos and Mondex shock absorbers.

Slippery Track Shortens Brighton Beach Racemeet; Burman and Kyle the Stars

Had the light but steady drizzle which made the Brighton Beach race track so slippery as to necessitate the abandonment or, better, the postponement of the Moross meet, which was partially completed on Labor Day, Monday last, 2nd inst., held off until the full seven events which went to make up the program had been completed, Robert Burman probably would have had four victories to his credit instead of the two which he managed to collect from the four and one-half events which were run off. As it was, Burman scored in all save one of the races in which he started, and had it not been for a balky motor on the Ohio, which caused him to lose even the proverbial "ghost's chance," he would have been in the fight at the end of that event also.

Despite the weather, however, which had threatened rain throughout all of the forenoon, and which later made good the threat with a light but steady downpour, both the grandstand and the field were literally packed with spectators.

By far the most interesting event of the meet was the 25-mile free-for-all, which attracted six contenders. E. Homan, in the Bergdoll entry, took the lead at once, but was displaced on the second lap by Burman, who piloted the Cutting. After once assuming the premier position Burman was never headed, and won in 25:28.66. The rivalry for second place was keen between Harry Kyle (White) and David Lewis (Stutz); the latter, however, skidded on one of the turns and lost ground, enabling Kyle to finish second; Lewis was a good third. But one three-mile heat was run for the Remy Brassard, and this naturally went to Burman, who made sure of clinching the honors by driving the Blitzen Benz. His time was 2:45.94. H. Hickman (Mercedes) was but a fraction of a second behind, Burman having passed him only as they came down the home stretch. Joe Grennen (Benz) took third place. The five-mile Class E event for cars with displacements of 600 inches and under was turned into a match race between Harry Kyle (White) and David Lewis (Stutz) when Burman's Ohio failed him before he had completed a single lap, and Menenghetti's Zust could not be started. Kyle took the event, covering the distance in 5:05.43. A similar event for cars with displacements of 301-450 inches resulted in a victory for David Lewis (Stutz). Kyle (White) had been a thorn in Lewis's side, so to speak, throughout the first four miles of the race, but an untimely skid which caused the car to turn completely around placed him in second position. Lewis covered the distance in 5:16.60. Third place went to M. F. Strauss (Marion). The baby car event, five miles for cars with displacements of 161-230 inches, started with but two contenders and resulted in an easy victory for William Burke (Studebaker "30"), who won in 6:02.35, over three seconds ahead of his contender, William Casey (Bergdoll). Weather permitting, the entire program will be re-run on Saturday next, 7th inst., when ticket stubs from Monday's meet will be honored. The summary:

Five miles, for cars with displacements of 161-230 inches—Won by William Burke (Studebaker "30"); second, William Casey (Bergdoll). Time, 6:02.35.

Five miles, for cars with displacements of 301-450 inches—Won by David Lewis (Stutz); second, Harry Kyle (White); third, M. F. Strauss (Marion). Time, 5:16.60.

Five miles, for cars with displacements of 600 inches and under—Won by Harry Kyle (White); second, David Lewis (Stutz). Time, 5:05.43.

Three miles, for the Remy Brassard and trophy. First heat—Won by Robert Burman (Benz); second, H. Hickman (Mercedes); third, Joe Grennon (Benz). Time, 2:45.94.

Twenty-five miles, Class E, for cars with displacements of 600 inches and under—Won by Robert Burman (Cutting); second, Harry Kyle (White); third, David Lewis (Stutz). Time, 25:28.66.

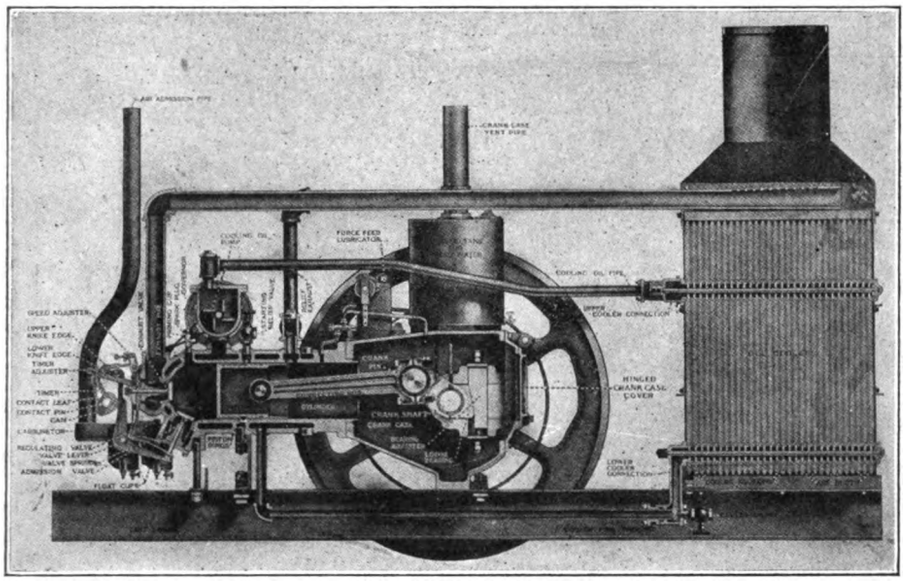
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MASSIVE MECHANISMS OF AMERICAN TRACTORS

Divergent Ideas of Divers Manufacturers as to Motors – Some Points Upon Which Many Agree – Extreme Simplicity vs. Refinement and Complex Construction – Gearing That Transmits Enormous Power and Withstands Constant Service and Rough Handling.

Tractors and their construction afford an interesting study to anyone keenly interested in motor-driven vehicles and who realizes the influence they and their developments are likely to have on the automobile industry itself.

There is a very wide difference of opinion even on the part of tractor manufacturers on the motor question. There would appear to be two main factions, so to speak, one building four-cylinder motors of the automobile type with such enlargement and alteration as may be considered necessary to adapt them to the strenuous conditions of agricultural service, and the other, with more or less disregard of automobile practice so far as general design is concerned, building motors with one and two cylinders, such as they consider best adapted to tractor work, having in view experience in the field rather than automobile experience. Which opinion is correct only time and the process of elimination can tell; but it seems probable that for a long time, at least, there will be staunch advocates of both types.



HART-PARR POWER PLANT AND OIL COOLING SYSTEM

Prominent among the advocates of the single and double cylinder motor, with large cylinder,s are the M. Rumely Co., of La Porte, Ind.; the Avery Co., of Peoria, Ill.; the Heer Engine Co., of Portsmouth, O., and the Hart-Parr Co., of Charles City, Ia., while the concerns that pin their faith to the four-cylinder automobile type include such well-known manufacturers as the Gas Traction Co., of Minneapolis, Minn., builders of the "Big Four"; the Holt Caterpillar Co., of Peoria, Ill.; the Diamond Iron Works, of Minneapolis, builders of the American tractor; the Kinnard-Haines Co., of Minneapolis, builders of the "Flour City" tractor, and the Buckeye Mfg. Co., of Anderson, Ind., familiar as makers of Lambert cars. In fact, the latter concern uses its standard 40-horsepower automobile motor in its tractor, which, however, is entirely reasonable because the machine is designed for light work as an orchard tractor, and the motor really is of high capacity in proportion to the work expected of it. All the engines are four-cycle, all are water or oil cooled and all, except the Lambert, run at medium or slow speeds. An interesting tendency is noticeable, in tracing points of similarity between the products of various makers, in that of the nine motors named all but two have their valves operated through rocker arms, the exceptions being the Lambert and the Big Four, in which the valves are operated directly by push-rods; and these two, with the addition of the Rumely, are the only ones in which the valves do not open directly through the cylinder heads.

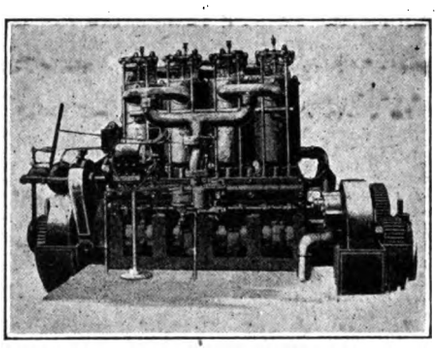
In the single and double cylinder motors the cylinder dimensions, of course, are enormous, as compared with motor car cylinders. The Hart-Parr 60-horsepower twin, for instance, has a bore of 10 inches and a stroke of 15 inches; the speed is very low—300 revolutions per minute. For the very heaviest work, this concern builds a four-cylinder motor of the opposed type, having two cylinders on each side of the crankcase, the bore and stroke being 9 inches and 13 inches, respectively. At a speed of 400 revolutions per minute this big engine will develop 80 horsepower, and without undue strain will work up to 110 horsepower. The Hart-Parr motors are made both in horizontal and in vertical form, but the differences, aside from position, are slight. The Rumely motors all are horizontal, with either single or twin cylinders, and all run at a normal rate of 375 revolutions per minute; a single cylinder of 10-inch bore and 12-inch stroke is rated at 30 horsepower at this speed, and, of course, two such cylinders, in the form of a twin engine, produce double the power. Both the Avery and the Heer engines are of the opposed type. The smallest of the Heer motors presents rather a striking example of conservative rating. With "square" cylinders of 6-inch bore and stroke the rating is 16 horsepower at 500 revolutions per minute, while the largest engine of this make, 40 horsepower, has cylinders 9 x 10 inches. In fact, the rating given all these engines would appear to be very considerably on the safe side. The four-cylinder motor-car type engines referred to also are of large dimensions, excepting the Lambert, which is not intended for the same class of work as the much larger tractors. The Holt caterpillar and the Big Four both are driven by "fours" having cylinders of 6½ x 8 inches. In the "Flour City" tractors motors of from 20 to 40 horsepower are installed, according to the size of the machine, the cylinder dimensions varying from 4¾ x 5 inches for the 20 horsepower to 7½ x 8 inches for the 40 horsepower. The motor of the American gas tractor is rated at 30 horsepower at 300 revolutions per minute, but it is designed to work without undue strain up to 600 revolutions per minute, at which speed the power rating is 60 horsepower. The bore is 7¼ inches and the stroke 8 inches.

In all the tractors named there are two sources of ignition current—magneto and dry cells—and in all cases but one the familiar high-tension spark ignites the rharge. The exdeption is the Holt caterpillar, on which the make-and-break system is employed. Current automobile practice is followed with regard to lubrication, all the machines having self-contained constant circulation systems. In the

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matter of cooling the motor cylinders, however, there is rather a divergence of ideas. There are two—the Rumely and the Hart-Parr—in which the cooling systems are filled with oil instead of water, and there is a further resemblance between the two in the fact that no fans are used, the draught through the vertical tubes of the radiators induced by projecting the exhaust through short stacks over the radiators serving the purpose admirably. In the Rumely radiator the vertical tubes are arranged in the form of a hollow square, while in the Hart-Parr the tubes are in a circle. It is claimed for the oil systems that the liquid does not boil away and therefore is practically never in need of replenishment, that there is no danger of freezing in the coldest weather and that the oil keeps all the surfaces with which it comes in contact in good condition, as well as lubricating the bearings of the circulating pumps. Among the advocates of water cooling there are two machines in which the cooling systems are as different as it is possible for them to be and still use the same fluid.

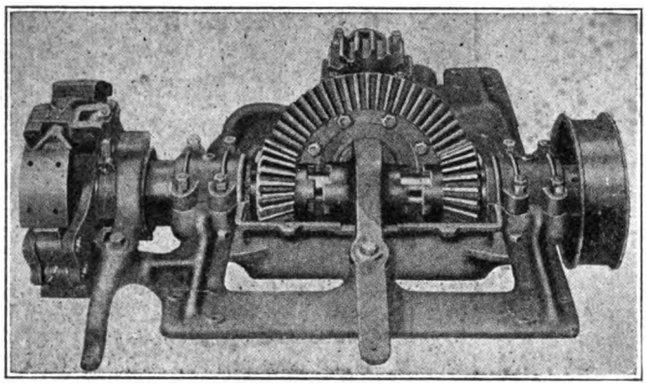
The "Flour City" tractor is an example of the limit of simplicity, for it has no radiator, in the ordinary sense of the word, and no fan. Instead of cooling a small body of water over and over, a very large quantity is provided, which is sufficient to keep the motor running practically indefinitely. No less than 348 gallons of water are contained in a big tank located on the front end of the main frame, and circulation is maintained by a rotary pump. A valve permits the water to be shut off from the motor so that in cold weather the motor can be drained without the necessity of emptying the tank, the large body of water in which holds sufficient heat to prevent freezing for many hours. In the case of the Holt caterpillar, on the other hand, the cooling system is decidedly elaborate, in that a comparatively small volume of water, circulated by a centrifugal pump, passes through a highly developed vertical tube radiator of the sectional type; in case of damage to any part one or more sections can be removed and the radiator used without them until the damaged part is repaired and replaced; or spare parts can be used in the meantime. The cooling system of the American tractor includes a box type radiator surmounted by a stack through which the exhaust passes, inducing a draught of air which makes a fan unnecessary.



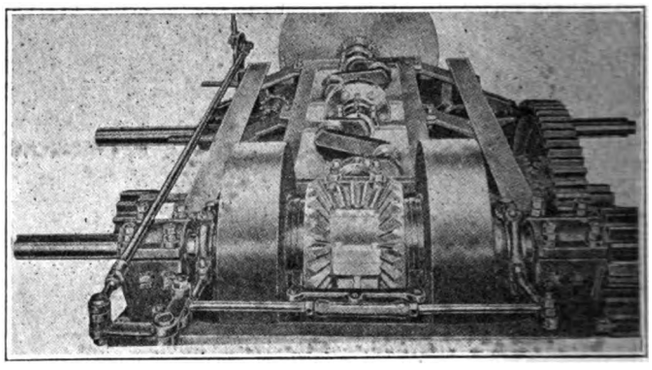
AMERICAN DOUBLE DRIVE MOTOR

The use of kerosene for fuel is one of the important features of merit claimed by a number of manufacturers; in fact, it frequently is stated that almost any fuel can be used — gasolene, benzine, kerosene or distillate—though the use of the heavier fuels necessitates starting up and getting the motor hot with gasolene. In the case of the Rumely tractor the standard fuel is kerosene, which is gasified and mixed in the Higgins carburetter, which is an important link in the power system. This carburetter is permanently adjusted at the factory, and thereafter requires no manipulation, the regulation of fuel and air being entirely automatic. A constant circulation of water, of which a small quantity is mixed with the fuel to prevent pre-ignition, is maintained by means of a suitable pump, and the oil also is fed by a pump, there being an excess pumped and the surplus returned to the tanks. The speed of the engine is regulated by a centrifugal governor which runs in oil in a tight casing and acts on the throttle.

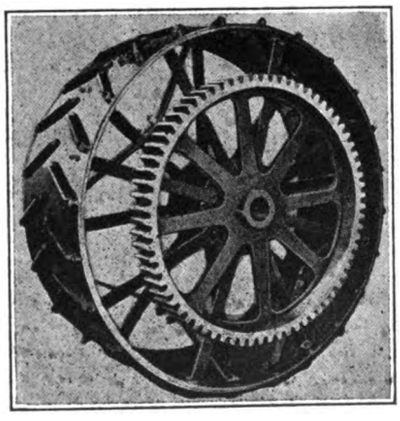
The Hart-Parr tractor is especially built to utilize kerosene, the motor being started cold on gasolene and the heavier fuel turned on when cylinders have become heated. As in the Rumely, a little water is used in conjunction with the kerosene to prevent pre-ignition. Not only is provision made for the separation of all foreign matter from the fuel, but the fuel passages are so large that their choking up is practically impossible. In fact, the smallest passage has a diameter of quarter of an inch. The fuel level is maintained by means of a simple float valve of the ordinary type, though it is, of course, ruggedly proportioned. A centrifugal throttling governor regulates the engine speed.



BEVEL GEAR DRIVE OF THE "BIG FOUR"



GEAR SYSTEM OF "FLOUR CITY" TRACTOR



RUMELY DRIVE WHEEL

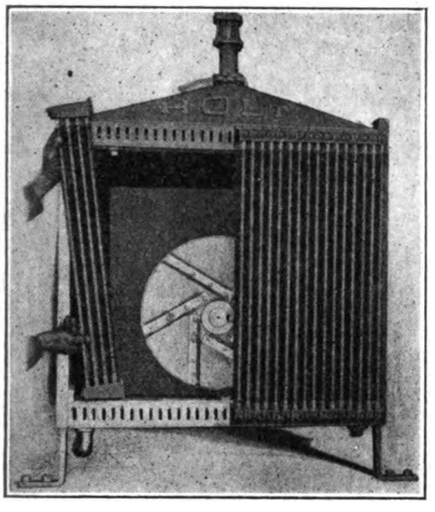
The opposed engine in the Heer four-wheel drive tractor is omniverous in the matter of fuels. When the carburetter is adjusted for gasolene the only change that is required for using other fuels is to slightly increase the proportion of oil to air when kerosene is employed; other fuels are handled with the same adjustment as that used for gasolene.

Power transmissions throughout the whole tractor family necessarily are exceptionally heavy and substantial, for the stresses to which they are subjected in transmitting to the driving wheels the energy developed by the motor when the vehicle is travelling at from two to three miles an hour and hauling plows are enormous. The most unusual construction is that embodied in the Holt caterpillar, which, in place of driving wheels, has a pair of broad, flat-faced chains which travel over sprockets driven from the engine, the object being to distribute the weight of the machine over the greatest possible area and so avoid packing the soil, and at the same

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time to afford the best possible hold on the ground. Furthermore, the chains form relativeyl long "tracks," which to some extent bridge over the inequalities of the ground and afford smoother going, according to the manufacturers, than driving wheels of practical dimensions. The Holt transmission system also includes a distinctive method of steering, which is necessitated by the fact that the broad chains cannot be handled in quite the same way as wheels when turning sharply.

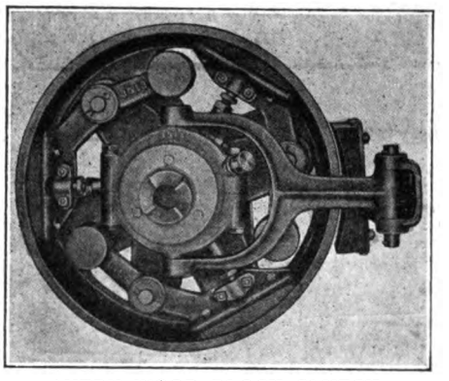
The drive from the four-cylinder engine at the front of the machine is through a multiple disc clutch and longitudinal shaft to a cross shaft over the drivers, a pinion on the clutch shaft meshing with an enormous crown gear on the cross shaft, which is supported by three bearings, one at each end and one in the middle; the middle bearing is extended forward in the form of a bracket to carry a bearing for the end of the clutch shaft, which also has a bearing



HOLT SECTIONAL RADIATOR

just forward of the pinion. The large crown gear is on the left side of the middle bearing, and on the right side is a plain wheel of the same diameter as the big gear. On the cross shaft are two sprockets which, however, are not attached directly to the shaft but to sleeves which are free to turn on the shaft; the sprockets are located just inside the outer bearings of the shaft, one on each side. Power is transmitted to them by means of friction clutches, a separate clutch for each sprocket; the plain side of the big crown gear is utilized for the driving member of one clutch and the large wheel on the opposite side of the middle bearing for the other. Each clutch has its separate controlling lever, the levers being placed close to the driver's seat. The sprockets drive, through chains, to a divided shaft below; the sprockets on the lower divided shaft drive through spring connections, so that the drive is cushioned. A very long bearing supports the inner ends of the divided shaft. There is no differential. In making slight swerves there probably is sufficient slip to permit the requisite variation in relative speed, while in making sharp turns the clutch of the inside driver is released and the machine is driven by the outer driver, the angle being governed, of course, by the single steering wheel in front.

Each of the Holt caterpillar tracks is driven by one of the sprockets on the divided shaft, and each runs over a second sprocket carried at the proper distance ahead on a heavy distance rod, which is adjustable in length. The second sprocket has no direct connection with the frame of the tractor, and neither of the sprockets carry any of the weight of the machine. A frame attached to the main tractor frame carries four heavy rollers in such a position

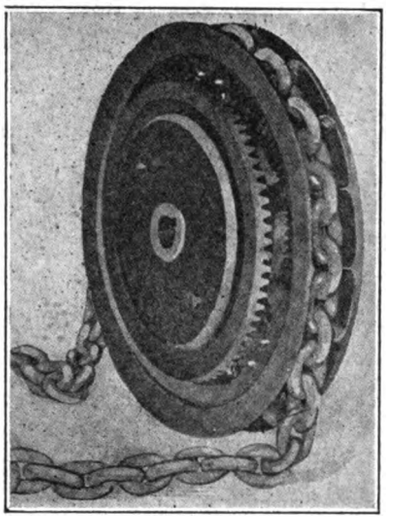


AVERY WOOD BLOCK CLUTCH

that their grooved peripheries roll on the inside faces of the caterpillar tracks. The rollers keep the track below the lowest parts of the sprockets, and the track, running under the rollers, throws the weight on them. A cushioning effect is secured by the use of heavy helical springs above the rollers. The driving face of the caterpillar chain is corrugated to give it a grip on the ground. The rollers all are mounted on heavy duty roller bearings, thoroughly protected from dust and dirt. Idler rollers in the top of the frame take the weight of the track off the sprockets, which thus are relieved of all but the actual driving stresses. The areas of the chain surfaces in contact with the ground are such that the pressure per square inch is very moderate. In the largest machine the chain is 30 inches wide and has a contact area of 3,600 square inches, and the ground pressure per square inch is only 4½ pounds.

In the case of the Heer Engine company's four-wheel drive tractor the object sought in departing from conventional methods of construction is, of course, to obtain maximum traction and, incidentally, equal distribution of weight and low ground pressure per unit of area. The very considerable weight of the machine is distributed about equally over all four wheels, instead of being concentrated largely on two. The two-cylinder opposed motor is mounted near the middle of the chassis with its shaft crosswise and driving from a pinion to a large gear outside of the frame. Under the frame and midway between the front and rear axles is a casing carrying the transmission gears, driven by the large gear referred to and giving two forward speeds and a reverse. Final drive is to the axles through very heavy steel chains of the ordinary cable type—not sprocket chains. The wheels are 51 inches in diameter and 12 inches wide and are made up of angle steel rim members joined by diagonally positioned cleats riveted in place. Gears and chains are of steel and the chains are hand made. Hyatt roller bearings are fitted throughout the tractor.

A machine that differs from other tractors in its method of motor mounting and power transmission is the American gas tractor, the four-cylinder motor of which is mounted with its shaft across the frame instead of fore-and-aft, as is usual in tractors with four-cylinder vertical engines. Each end of the crankshaft carries a spur pinion meshing with a gear on a countershaft mounted just back of the motor; the crankshaft pinions can be engaged or dis-



HEER CHAIN DRIVE

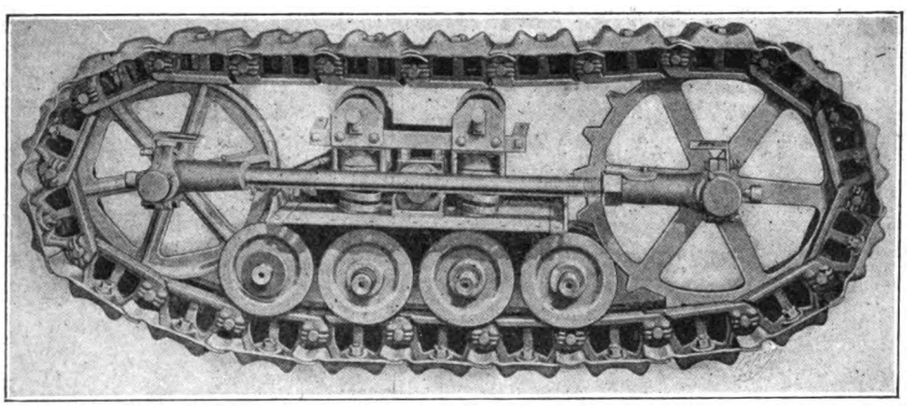
engaged by means of cone clutches, there being one for each pinion. A single lever controls both clutches. The object sought in driving from both ends of the engine shaft is the equal distribution of driving stresses over the crankshaft, and the makers state that, as a result of this construction, they have had no trouble whatever from broken shafts. Drive from the countershaft is to a gearset which provides for three speeds and a reverse, all through spur gears, the various gears being brought into action by means of individual clutches. The low speed is 1.25 miles per hour, the intermediate 2.2 and the high 3.25 miles per hour; the reverse is the same as the low. A heavy pinion in the center of the change gear shaft drives to a large gear on the differential shaft, the ends of which carry the pinions driving to the rear wheels through internally toothed bull gears bolted direct to the wheel rims.

The American tractor is different from most others also in that it reverses the usual arrangement. The operator is seated at the front end, beside the gasolene tank, and the radiator, with its hood and stack,

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is placed at the extreme rear; the motor is directly behind the driver, and there is a platform where a man can stand and work on the motor with convenience. It is believed by the makers that the driver can do much better work if he is seated where he can get a good view of the ground he is working over.

When a heavy, powerful tractor is driven through two wheels, as is the case with most of the machines in use, it is clear that to drive through the axle would involve difficulties of no small proportions in designing parts of sufficient strength without prohibitive weight. The simplest and most practical way out of the difficulty, judging from the number of cases in which it has been adopted, is to mount a large gear or circular rack on each driving wheel, as near as practicable to the rim, and drive direct to this gear. The axle, hub and spokes of the wheel thus are eliminated from the power transmitting system and perform only the comparatively easy work of carrying the vehicle. In the case of the "Big Four," which has driving wheels 8 feet in diameter, the drive is taken direct to the rim through steel braces extending from the gear to the rim; the gear is steadied and centered by five heavy spokes which radiate from the hub and are adjustable as to length so that the gear can be set to run true.



CHAIN TRACK SYSTEM OF HOLT CATERPILLAR TRACTOR

As is usual in agricultural tractors, the main frame rests directly on the rear axle, without the intervention of springs, so that the relative positions of the gears and the driving pinions on the countershaft are fixed. The steel tubular countershaft is enormously strong, being no less than 5 inches in diameter; the bevel gear differential is mounted near one end, just outside the frame. The two countershaft bearings are formed in a single casting bolted up to the under side of the main frame, this method of construction obviating the possibility of the bearings getting out of alignment. The four-cylinder engine, which is mounted fore-and-aft, drives through bevel gears to a cross shaft carried on the main frame above the differential shaft, the driven gear being mounted on the differential casing in the usual way. The bevel gear on the engine shaft meshes with two bevels on the cross shaft, at diametrically opposite points. These two bevels are free to turn on the cross shaft without driving it except when one or the other is engaged by a dog clutch which is mounted on the shaft between them. With one bevel engaged by the clutch the tractor goes forward, and the reverse is obtained when the other bevel is engaged, while the engine runs free with the clutch in neutral position. There is also an internal expanding friction clutch, so that the dog clutches can be engaged while the shaft is stationary and the engine running, avoiding shocks and jars. There is but one speed, which drives the tractor slightly faster than the walking gait of a horse.

The big driving gears on the Flour City tractor—or, as they are termed, the "bull gears"—are mounted on the hubs of the driving wheels, but are braced to the rims, which thus take the driving stresses direct, while the hubs keep the gears centered. The principle adopted in the transmission system is the same as in the Big Four—that is to say, the longitudinal motor shaft drives a cross shaft through bevel gears, and the cross shaft drives a countershaft having pinions meshing with the bull gears; the differential is on the countershaft. The space between the two bevels on the cross shaft, however, is occupied by a heavy bearing; there are no dog clutches, but instead a pair of friction clutches which serve to give the forward or reverse speeds at will. Both speeds are the same, driving the machine from 2 to 2½ miles an hour. A single lever controls both forward and backward clutches.

The bull gears of the Rumely "Oil Pull" tractor are keyed to the hubs of the driving wheels and are provided with integrally formed brackets projecting from their rims to which are bolted the braces through which the driving power is transmitted to the wheel tires. The wheel spokes are of flat iron, 2¾ inches wide and ¾ of an inch thick, with T-heads for attachment to the tires, to which they are hot-riveted. As the Rumely motor is set with its shaft crosswise of the main frame—which, incidentally, is of enormous strength, being no less than 12 inches deep—no bevel gears are employed, drive being through spur gears throughout.

The Hart-Parr bull gear arrangement is different from that found in other tractors in that it is of the internal type, the driving pinion meshing with teeth cut in the inner face of the ring. The bull gear is bolted direct to the rim. Owing to the fact that the reversing gear is of the planetary type, there is no gear shifting in this machine, so that the gears always maintain their relative positions. The differential is of the spur gear type, and some idea of its strength can be gained from the fact that the teeth are of 7-inch face. All the pinions are enclosed and run in oil. The friction clutch is of such large size that it is employed as a brake, and no extra parts are required for this purpose. There are two forward speeds, obtained through the planetary gearing, the low speed being 2.2 miles per hour and the high 4 miles per hour.

The Avery tractor has its bull gears centered on the hubs and braced on the rims; they are of heavy construction, with 4-inch faces, giving very large wearing surfaces. The transmission gearing is worked out with a view to the utmost simplicity, there being but two main shafts, the crankshaft and the countershaft, without intermediates. A special feature is the mounting of the engine and gearing on a sliding frame, which can be moved bodily, thus permitting the use of three different sized pinions for varying road speed and permitting the user to gear his machine to the speed that best suits the local conditions.

The gas tractor offers the farmer a number of advantages that are not possessed by the steam engine. Among others, there is practically no danger from fire, whereas with the steam engine great care is necessary, especially when threshing, for if the wind blows from the engine to the work there is serious danger of sparks being carried, and for this reason it often is necessary to place the machines awkwardly, and also to shift them to suit the vagaries of the wind. The procession of wagons and men that attends the steamer is abolished in the case of the gas tractor, and in some cases one, or at most two, men are sufficient to handle a tractor continuously. No time is lost getting up steam, and no fuel is wasted either in this process or in banking fires during idle intervals. There is no boiler to be injured by improper handling, and the danger of explosion, which, unfortunately, is too prevalent among steamers, is entirely absent. And as for intricacy of mechanism, it is a matter of note that farmers are buying motor cars every day, and that they are using them with highly gratifying results. A farmer who can run and care for his motor car will have no fear of the much simpler mechanism in the tractor which rids him of many horses and untold trouble, to say nothing of its effect upon his financial condition.

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CARBURETTER SCIENCE SIMPLIFIED

Experiments That Show Efficiency of Combustion—Pure Oxygen and Its Effects—Problems Involved in Automatic Control.

While the subject of carburetters and carburation is one of such vastness, both in its theory and in its practical application, that volumes can be—and have been—filled without exhausting the topic, the basic principles are simple, comparatively speaking, though not every writer who has essayed the task has been so successful in presenting the matter in an easily comprehended form as the author of "Carburetters and Carburation," in an article which appeared in the English "Motor" and which is here reproduced. The principles of carburation in general, the results that have been obtained as compared with what is possible according to theory, and the lines that must be followed in seeking for improvement are brought out, not in obscure scientific language, but in the "King's English," that he who runs may not only read but also understand.

After dwelling somewhat upon the fact that a car which, theoretically, should cover a distance of 40 miles on a gallon of "spirit," usually accomplishes about half that mileage, the author begins at the beginning with a little simple chemistry, upon which the whole action of the internal combustion motor is based.

"Taking the average gasolene as supplied for pleasure car use," he says, "this has a density approximating 710 (it may be pointed out that the weight of an equal volume of water would be 1000). The chemical composition of this gasolene may be taken as $C_7 H_{16}$ (heptane); that is, the molecule consists of seven atoms of carbon combined with sixteen of hydrogen. This compound burns, or combines with oxygen, in the manner explained by the following chemical equation:

$$C_7H_{16} + 11\ O_2 = 7\ CO_2 + 8\ H_2O$$

or, using the King's English, one volume of gasolene combines with eleven volumes of oxygen and forms seven volumes of carbon dioxide, together with eight volumes of water (steam).

"The importance of this matter from the point of view of carburation resides mostly in the first half or left-hand side of the equation, as the second part—the actual combustion—takes place inside the engine, after the carburetter has done—or should have done—its work. We see from the equation that each volume of gaseous gasolene requires for its complete combustion 11 volumes of oxygen, or, taking into account the proportion of oxygen in the atmosphere, the one volume of gasolene requires no less than 53 volumes of air. It will be noted that gaseous gasolene is spoken of; one volume of liquid gasolene will form, approximately, 160 volumes of gas, under normal conditions of temperature and pressure.

"The problem of carburation is to ensure that, no matter what the speed of the engine or the position of the throttle, the correct volume of air always will be supplied to suit the amout of gasolene which is being passed through the jet. This is a problem which has severely exercised the minds of many hundreds of engineers and experimenters during the past dozen years and more; their efforts are partly visible in the extensive range of carburetters of all types which are on the market to-day, all possessing some special feature or other, and yet (with due respect to the inventors!) no single one even approaching perfection within quite a long range. A perfect carburetter would be able to give something like 35 miles or 40 miles per gallon in the case of the average 15.9 horsepower (18 mm. bore, four-cylinder) engined car, and this with its normal load and with the implied conditions of full power, speed, slow running, and good pick-up. The most sanguine carburetter-maker—and they generally are optimists—would hardly claim this degree of excellence for his production. If a carburetter is ultra-economical, it usually entails an engine with poor acceleration powers and inability to run slowly, or else vice versa. It seems, or, rather, has seemed, so far as we have yet progressed, quite impossible to produce a carburetter which will give all the desiderata which have been laid down above.

"The carburetter experimentalist has open to him one very simple and accurate means of testing his efforts; that is, by analysis of the exhaust gas. The right-hand side of the equation shows what should be produced if perfect combustion takes place; to the carbon dioxide and water vapor must, of course, be added the nitrogen from the air (if only Nature had not given us nitrogen in the air!) which has been taken in along with the oxygen of the atmosphere and discharged unchanged—except that it has actually stolen some of the valuable heat and power in its passage. Incidentally, this should enable the novice to appreciate the influence of a supply of pure oxygen, which has often been done in racing car engines (at Brooklands the practice is normally forbidden). For each volume of useful oxygen drawn into the engine under ordinary conditions, nearly four volumes of inert nitrogen are also taken in; by replacing these four absolutely useless volumes with oxygen (and, of course, increasing the gasolene supply to suit), the power would be increased many times—not four times, because the combustion chamber would become intensely hot and the internal friction excessive. Also, the engine would probably burst under the vastly increased load, unless specially designed for such great pressures.

"To return now to the matter of exhaust gas analysis, the discovery of any constituent other than the carbon dioxide, water vapor, or nitrogen, at once indicates imperfect combustion—ergo, bad carburetter. If carbon monoxide (CO)) marsh gas (methone—CH_4). or carbon itself (the black smoke which occasionally is seen belching out of the exhaust pipe) is found, it is quite clear that the mixture which has been burning in the engine has been too rich; on the other hand, a weak mixture will be revealed by the presence of oxygen in the exhaust. Thus, carburetter experiments can conveniently be conducted, to quite a large extent, without running the car on the road; of course, acceleration and slow-speed-pulling qualities can only be discovered by actual trial, but it is useful to find that the bulk of the experimental work can be comfortably done on the test bench, where closer investigation and more uniform conditions are possible.

"The main functioning of a carburetter is two-fold; it must mete out the correct quantity of gasolene for the amount of air which is being drawn in by the suction of the engine, and it must also properly vaporize the fuel. A third necessity, which is more a detail of design, calls for the complete and homogeneous mixing of the gasolene vapor and the air before the two supplies reach the engine. The vaporization of the gasolene may also be regarded as more or less a matter of the correct arrangement of the parts and of the supply of adequate heat for the air or the gasolene itself. It is the first requirement which presents such an obstacle; at any particular speed, or within a limited range of engine speeds, it is a very easy task to supply the necessary amount of gasolene—a good instance is provided by the earlier types of aeronautical engines, which had no carburetter as we know it, but simply a pipe which dripped gasolene at a predetermined rate into the induction pipe. It is the widely divergent speeds of running and the heavy torque required from the modern car engine which cause so much difficulty in the matter of supplying a carburetter to meet every demand. With the throttle lever in the full-open position, the engine will at one moment be racing the car along at full speed; a few minutes later the car will be slowly climbing a hill on top gear. With nearly closed throttle, the engine must turn over quietly and regularly while the car is stationary; down a long grade the engine may be racing away nearly all out with the throttle again almost closed. In all these different cases, the amount of air which is passing through to the engine varies very greatly, but the carburetter must supply neither too little gasolene nor too much. So it will be realized that the problem in front of the designer is one of no mean order.

"A very interesting and instructive method of examining the actual performance of any given carburetter was evolved several years ago by Prof. W. Morgan, B. Sc., and this gives some very valuable pointers to the carburetter investigator. As the carburetter must supply the correct

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ratio of gasolene to air at all speeds, by actually measuring the respective amounts taken in at different speeds and at different throttle openings, a very good idea of the performance of the carburetter is obtained. If the carburetter is functioning in a perfect manner, the ratio of gasolene to air will always be a constant value, equal to the theoretical value, and if a graph be plotted of the values of the amounts of gasolene and of air, the points of the said graph will all lie along a straight line. Any position on this line (called the perfect mixture line) indicates the correct ratio of gasolene to air; if a point above this line be taken, it will indicate a higher ratio of air to gasolene than the perfect proportion —that is, it will indicate a weak mixture. On the other hand, any position below and to the right of the line indicates a rich mixture.

"All that has to be done, then, to determine the value of any type of carburetter is to arrange for the engine to which it is fitted to be driven at different speeds, by an electric motor or otherwise, and for the provision of suitable means of measuring the amount of gasolene taken in (a long graduated glass tube may conveniently be used) and the amount of air and gas which passes out from the exhaust and an ordinary gas meter of one of the many forms will prove quite suitable for this. The exhaust, rather than the entering air, is measured, because the latter may be taken in through several different orifices, and, also, it is more convenient, from the experimenter's point of view, to leave the carburetter unencumbered. Of course, from the amount of gas measured as coming from the exhaust, it will be necessary to subtract the quantity of gasolene, to obtain the correct value for the air taken in, though, as the gasolene will normally be less than 1 part in 800 (i. e., the ratio of liquid gasolene to the volume of air required), the error is usually negligible.

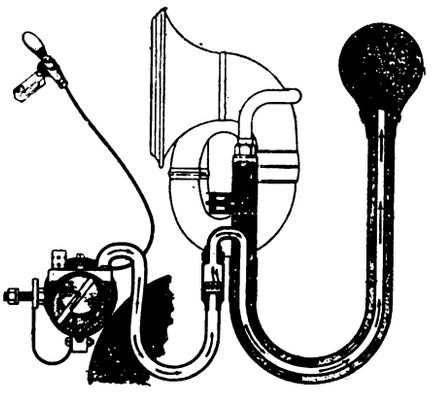
"The method of making the test of any carburetter is not at all involved. The electric motor is made to turn the engine at a definite speed, say at 1,000 revolutions per minute. Then, with throttle full open, the gasolene and air values are measured over a definite interval of several minutes duration. The ratio thus obtained is marked down. Then, with the engine turning at the same speed, the throttle is placed in the three-quarter position and the ratio is again measured. A perfect carburetter would give the same ratio, but it is almost always found that the throttle position exercises a marked influence on the strength of the mixture.

"When the corresponding values for half, quarter, and almost-closed throttle positions have been obtained, the same series of measurements can be made at another speed, say at 1,200 revolutions per minute. Proceeding in this way, a set of results are obtained which cover the whole of the running conditions. These results can be plotted in a series of curves, one for each definite engine speed, and the value of the carburetter will at once stand revealed from the amount by which these curves depart from the 'perfect mixture' line. This particular carburetter was an experimental production of the type known as the 'plain jet and tube,' in which no auxiliary air entrances above the jet are provided. It will be observed that the mixture is always weak at first; it gradually becomes richer, and at high speeds the mixture provided by a carburetter of this sort is always very rich. That is why extra air devices of many kinds are used; at low speeds, where the mixture is weak—that is, the graph runs above the perfect mixture line—no extra air is needed, but when the speed and throttle position together result in rich mixtures, the extra air devices are designed to bring the curve back to the ideal line. There is no good reason why a carburetter of this sort should not give excellent results, the only difficulty being the necessity for a very fine adjustment of the size of the valve and the strength of the spring. Many forms of carburetters have extra air ports, which are uncovered by the movement of the throttle.

"There are on the market several 'automatic' carburetters which have no extra air valves or ports; the action and principles of several, at least, of these can be easily explained by one of these mixture-strength diagrams. It will have been noted that a plain jet carburetter will give a graph which forms approximately a straight line; the inclination of this line will vary according to the size of the jet and area of the choke tube, and it is possible to obtain a graph which lies parallel with the 'perfect mixture' line, even though it will always be found to be on the weaker side of it. Now, having obtained this condition of affairs, it will be recognized that all that is necessary to make this carburetter give approximately a correct mixture throughout its range is the addition of a constant amount of gasolene—i. e., a steady addition which is not influenced directly by the suction of the engine. This additional amount is obtained in various ways—several well-known examples will occur to mind—and the result is a very good approximation to the perfect carburetter—theoretically speaking. Whether the practical aspect is equally good is a matter for the user to say."

Bulb Horn that Affords Sustained Note.

Bearing the name Sonophore, a bulb horn embracing not a few radical features, all of which are calculated by the maker, M. Beaupied, of Lyons, to make the device better fitted to hold its own in competition with horns of the electric and exhaust types, has appeared on the French market, but whether the complications involved justify the ends attained is an open question. Probably the most interesting feature of the device is that any degree of noise can be produced from the short, orthodox "honk" to the long sustained wail. The



latter is produced by virtue of a stream of air which is supplied from a small pump, the action of which is under the control of the operator. The pump, which is of the rotary vane type, is operated from the flywheel of the motor through the intermediary of a small friction wheel which is brought into engagement by pressing a short lever positioned on the steering column and to which the pump is attached by means of a Bowden wire transmission. The pump is returned to the position away from the flywheel by a spring. To render the sound produced continuous and not harsh, as would be the case were the air permitted to enter the horn directly from the pump, the air first is carried to the bulb, which, because of its flexibility, acts as a gas bag and eliminates the "beats" which are occasioned by the action of the pump. The air is conducted to the bulb through a flexible tubing which is enclosed in the orthodox tubing which connects the horn and the bulb, and passes to the horn through the latter. To prevent the air from the bulb from entering the pump when the shorter blasts are produced, a small check valve is provided. Obviously the tone produced by the horn depends upon the speed of the motor.

Proper Angle for the Windshield.

To a greater or less degree, the value of a windshield depends upon the method of using it. For instance, if a windshield is set perpendicular to the earth when the top of the car is lowered and the rear curtains buttoned in position, the effectiveness of the shield is greatly decreased, for the draughts will enter through the space between the top and the top of the windshield and be reflected from the sides and rear curtain and form eddies which envelop the driver. If, however, the shield is slanted slightly and the rear curtain raised so as to afford free passage for the current of air, the latter will hug the under side of the top and pass on out at the rear and will not interfere with the comfort of the driver. The angle at which the shield is most effective when the top is lowered can be determined in a very few minutes by a little experimenting which can be done without any difficulty.

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FOR THE CONVEYANCE OF INVALIDS

Car of Striking Design That Was Built to Special Order—Interior Arrangement Simple but Sufficient.

However much the luxury of motion provided by a well-hung motor car may be appreciated by people in good health, there hardly can be a question as to its beneficial effect upon those who belong to the invalid class and who, perhaps, are unable to stand the jolting of less easy-riding conveyances. It is easy to believe that the use of a really good motor car might, in many cases, be the means of carrying an invalid from sickness to health, and in any case such a conveyance makes travelling as easy as it can be made for those who, while physically disabled, must be moved.

"Invalid cars" are not new, but one that is particularly striking, at least in respect to body design, is shown in the accompanying illustration; the body work is the product of the Arter Auto Carriage Co., of 6112 Euclid avenue, Cleveland, O. The large side windows, the curtains and the general arrangement and finish give the machine more the appearance of a very large limousine, perhaps, than anything else; certainly the effect is not that of an ambulance, which is at once recognized by its peculiarities of appearance. As the interior view shows, the car is fitted up with a view to luxury, rather than to the hospital-like necessities of the ambulance, and the invalid who does not feel equal to the task of sitting up in an ordinary seat can stretch out in comfort on the couch in the car. There are a couple of folding seats for the use of attendants; these drop down against the wall when not in use. The space under the couch is available for storage purposes, being accessible through conveniently placed doors. A low step in the rear makes access to the interior quite an easy matter.

The chauffeur's compartment is as completely enclosed as the rear of the car, so that everyone is protected and the car may be used with comfort, regardless of weather conditions. The front window is built after the fashion of a windshield, opening horizontally to afford good ventilation.

Gauges that Require Five Years to Make.

One of the items of the equipment of the Timken-Detroit Axle Co., of Detroit, Mich., is a set of master gauges by which all service gauges in the works are calibrated. The gauges are made by Johannson, of Eckelstuna, Sweden, and the 81 little blocks of steel, with their two holders and containing case, cost $800.

The gauges are made in various thicknesses, from one-twentieth of an inch up to four inches, and by combining them any desired measurement, within the maximum capacity of the blocks, can be obtained with absolute accuracy. For use the blocks are placed in a holder and clamped together by means of a screw with a milled head; the ends of the blocks project sufficiently to take the gauges to be calibrated. So accurately are the surfaces finished that when brought into contact they adhere sufficiently to support their own weight, because air cannot enter between them, and they are held together by the pressure of the atmosphere. According to the Timken Magazine, the house organ of the Timken company, it takes Johannson from five to seven years, working under secret process, to season and shape up a set of these gauges—which goes a long way toward explaining why they cost so much. Not that it requires that time for the actual work; the metal is allowed to stand and season for long periods between the various forming operations, just as wood is seasoned, in many manufacturing processes.

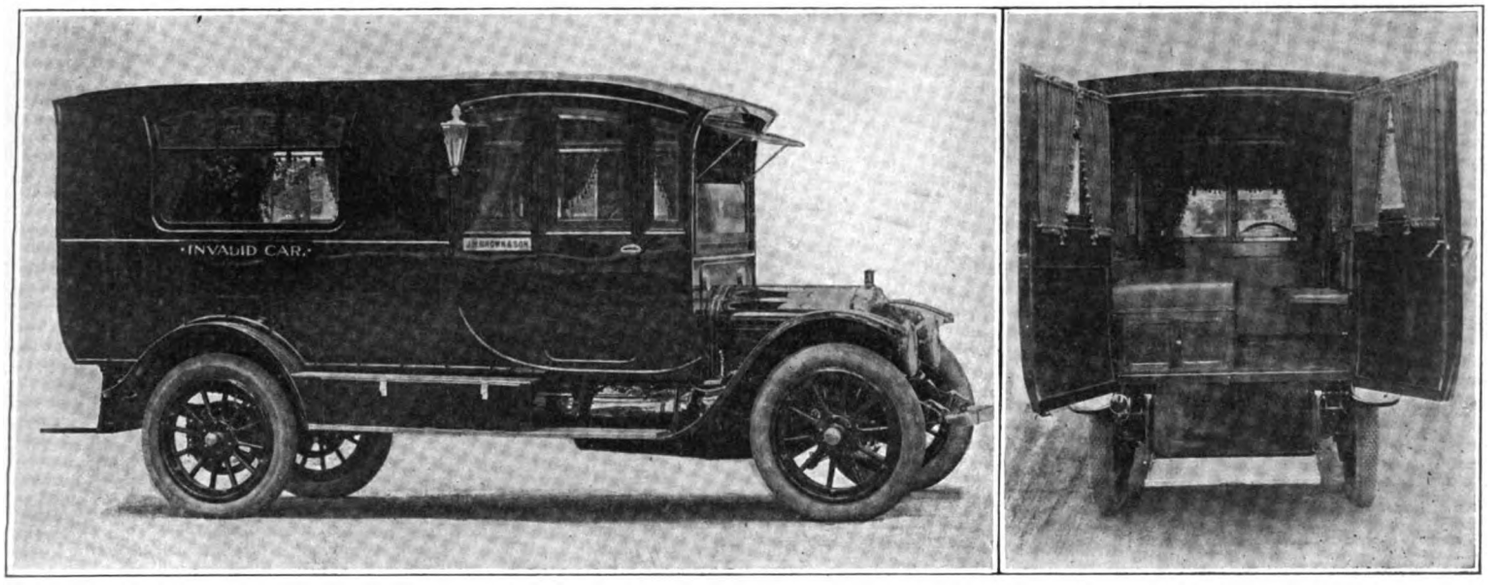
WOOD WHEEL PRINCIPLE IN STEEL

Foreign Inventor, However, Expands Spokes Instead of Shrinking Rim—How He Performs the Process.

The strength of a wood wheel lies very largely in the fact that the spokes are under compression between the rim and the hub, the pressure being set up by the shrinking or forcing on of the rim or band. A steel wheel embodying this principle now has been brought out by a London concern, under the style L.A.S.T. wheel. Pressed steel cups are riveted to the inside of the rim, and the outer ends of the tubular spokes are forced over them by pressure. Into the space between the inner ends of the spokes is forced a steel ring, the diameter of which is such that a predetermined amount of force is required to wedge it into place, pushing the spokes against the rim. When the ring is placed the pressed steel hub, made in two halves, is placed in position and welded by the oxy-acetylene process. As the center rings are not tapered, a special mandrel is employed in setting them. There is a shoulder cut on the mandrel against which the ring fits, the mandrel increasing in diameter up to the exact size of the ring, the largest diameter being at the point where the ring comes against the shoulder. Thus the spokes are expanded until the ring slips in.

Cannon Converted into Crankcases.

In the olden days it was the proper thing to convert swords into ploughshares in times of peace; but the Diesel engine factory in Turin, Italy, has brought this a special mandrel is employed in placing principle up to date by melting up a lot of old brass cannon and making motor crankcases of them.



NOT QUITE AN AMBULANCE AND ALMOST A LIMOUSINE; A LUXURIOUS INVALID CAR

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1,015,328. Magneto Circuit Controller. Edwin S. Lincoln, Brookline, Mass., assignor to Electric Goods Manufacturing Company, a Corporation of Maine. Filed Jan. 27, 1910. Serial No. 540,415.

In combination with a current inducing means including an energizing circuit, instrumentalities for controlling the flow of current in said energizing circuit, said instrumentalities including an electric circuit for actuating the same; an electric generator having current generating windings, one portion of said windings being electrically connected in energizing relation with said energizing circuit, and another portion of said windings being connected in energizing relation with said actuating electric circuit.

1,015,360. Vehicle Top Bow Clamp. Ralph Thompson, Brookline, Mass., assignor to A. E. Thompson, trustee, Brookline, Mass. Filed Apr. 28, 1911. Serial No. 623,866.

A bow clamp comprising a bow-supporting lower jaw adapted to be detachably secured to a fixed supporting member and having a seat for the lower bow and a coupling member at the outer portion of said seat, an upper jaw formed to bear on the upper bow and having a downwardly projecting shank, a depending tension member adjustably connected with said shank and having a plurality of coupling members adapted to interchangeably and detachably engage the coupling member on the lower jaw, and means for exerting tension on said member to press the upper jaw toward the lower jaw.

1,015,422. Combined Tire and Trunk Holder for Automobiles. Archibald U. Campbell, Toledo, Ohio. Filed June 20, 1911. Serial No. 636,001.

In a tire holder, a base-block having a lug rising from the inner side thereof and provided with a laterally projecting socket, an angled lock bar having an end mounted for pivotal and reciprocal movements in said socket and extending outwardly and downwardly from said lug to co-operate with the base and lug to embrace a tire, and means for locking the outer lower end of said bar to the base block.

1,015,441. Separator for Ball Bearings. Henry Hess, Wawa, Pa., assignor to The Hess-Bright Manufacturing Company, Philadelphia, Pa., a Corporation of Delaware. Filed Feb. 13, 1909. Serial No. 477,742.

A separator for ball bearings comprising a plurality of telescopic sections and resilient means tending to force the sections apart, each of the sections being formed with a portion to engage in the raceway of the bearing and with its outer or ball-engaging end of smaller size than that of said portion.

1,015,451. Spring Tire for Vehicle Wheels. Archibald B. McQueen, Dunnellon, Fla. Filed Feb. 4, 1911. Serial No. 606,553.

In combination a vehicle wheel rim having outer flanges, a flexible casing, a second casing arranged within the flexible casing and comprising a plurality of metal plates hingedly connected to one another, the metal plates having inner projections, a securing ring for confining the casings to the rim and having outer projections, and conical springs arranged between the securing ring and the outer portion of the inner casing and having their ends fitted to the projections of the said securing ring and the inner casing.

1,015,466. Oiling Device for Gasolene Engines. William E. Adams, Salem, and William J. Murray, Beverly, Mass. Filed Oct. 11, 1907. Serial No. 396,873.

The combination with an open-ended cylinder and a piston working therein, of an oil receptacle provided with an oil discharge orifice, said orifice being located at all times without the cylinder, means for supplying oil to said receptacle under pressure and means operating in timed relation to the movement of the piston to permit a jet of oil to escape intermittently from said orifice into the open end of the cylinder, substantially as described.

1,015,470. Lubricator Filling Vessel. Allen A. Bowser, Fort Wayne, Ind., assignor to S. F. Bowser & Company, Incorporated, Fort Wayne, Ind., a Corporation of Indiana. Filed Apr. 11, 1907. Serial No. 367,559.

In a device of the class described, the combination of a receptacle provided with a discharge outlet, a valve for controlling the outlet, a stem for operating the valve, a guide for the stem, a flexible member co-operating with the guide and through which the stem passes, and adapted to bind against the stem and to hold the valve in its adjusted position, and means operatively related to the valve adapted to engage the wall of the outlet and wipe the liquid therefrom to prevent accumulation of liquid discharged into the nozzle beyond the valve seat.

1,015,474. Covering for Automobile Radiators and Hoods. Calvin Bullock, Denver, Colo. Filed Dec. 12, 1910. Serial No. 596,938.

A covering for the radiator and hood of an automobile engine, composed of three members, namely, a body member for covering the hood, a relatively narrow strip for covering the radiator at the top and sides, the body member overlapping the relatively narrow strip, and a third cap member for covering the exposed end of the radiator, the narrow strip being provided with perforations adapted to receive the projections of the relatively narrow strip, and suitable means for securing the said members in place on the protected parts.

1,015,477. Speed Changing Mechanism. William C. Conant, Riverside, Ill. Filed Mar. 4, 1911. Serial No. 612,348.

In speed-changing mechanism, the combination with alining drive and driven members, of planetary gear mechanism operatively connecting said members together for driving said driven member at a different rate of speed than that at which said drive-member rotates, and additional gear mechanism operating, in conjunction with said planetary gear mechanism to balance the forces between the drive and driven members.

1,015,481. Variable Differential Speed Gear. Edmond Draullette, Paris, France. Filed Mar. 7, 1908. Serial No. 419,826.

A variable direction and speed device with epicycloidal differential gearing and extensible pulleys comprising in combination: a main shaft, two extensible pulleys keyed on the main shaft, the driving gear between said pulleys, a secondary shaft, sleeves loosely mounted upon the said shaft; two other extensible pulleys, a planetary gearing between the last mentioned pulleys and on the secondary shaft, and connecting means between each pair of extensible pulleys, the said planetary gearing being composed of three parts, the annular part connected to one of the pulleys and the satellites connected directly to the fixed cheek of the other extensible pulley, and the central pinion transmitting the movement, whereby the final or transmitted movement may be changed in speed or in direction or caused to cease by varying the relative speeds of the annular part and of the satellites; the said pulleys, annular part and central pinion being keyed upon the said special sleeves loosely mounted upon the secondary shaft which is driven from the central pinion; substantially as described and for the purpose set forth.

1,015,483. Lamp Attachment for Automobiles or the Like. William R. Elwell, Chicago, Ill., assignor to The Firm of Pierce, Fisher & Clapp, Chicago, Ill. Filed June 2, 1911. Serial No. 630,937.

In lamp attachments for automobiles and the like, the combination of a suitable support, a head mounted on said support to rotate about a vertical axis, a lamp supporting bracket horizontally pivoted at its lower end to said head, a vertical shaft extending axially through said head and a crank arm on the upper end of said shaft connected to said bracket for tilting the same, substantially as described.

1,015,545. Creeping and Anti-skidding Device. William S. Craig, St. Marys, Ohio. Filed Dec. 7, 1910. Serial No. 596,005.

In a device of the type specified, the combination with a wheel, of a series of bearings comprising socket members mounted thereon, a corresponding series of bearings comprising hubs with ball portions engaging said socket members, a spur rigidly united to each of said hubs, a pintle projected through axial openings in the socket and hub members and whereon said hub has a rocking and longitudinal movement which enables the spur to have the necessary movement, and means for rocking all of the spurs simultaneously through the movement of the hub members of the bearings, substantially as specified.

1,015,557. Wheel Rim. Henry Gillette, Belpre, Kan. Filed Aug. 17, 1911. Serial No. 644,562.

A wooden wheel rim having a circumferential groove formed in its outer face, and a continuous pipe constituting an oil reservoir disposed in said groove and formed with a plurality of perforations in its inner face.

1,015,595. Automobile Horn. William Edward Stephens, Chicago, Ill., assignor, by direct and mesne assignments, to Aermore Manufacturing Company, Chicago, Ill. Filed May 8, 1911. Serial No. 625,758.

A horn comprising a suitable coupling, the outer end of which is reduced in diameter and forms a shoulder, a plurality of studs on the end of said reduced portion, a plurality of cylindrical fluid pressure tubes arranged around a central core having open ends the edges of which engage said studs, cut-away portions in the ends of said tubes adjacent said coupling, and a plurality of nozzles tapped through the shoulder in said coupling tangential to the axis thereof and intersecting the edges of said cut-away portions.

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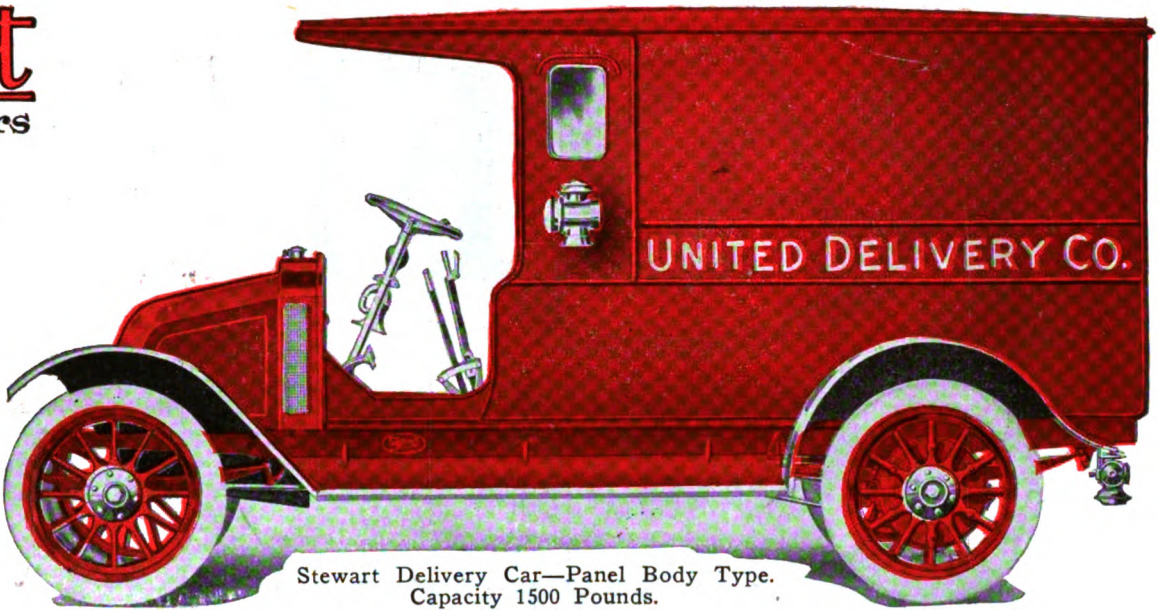
Stewart Delivery Cars

$1650

(Chassis)

Stock Bodies

'anel $150
:xpress with Top $125
)pen Body with Cape Top $125
pecial Express Body with wire grating.$150
Undertaker's Car Body $550



Stewart Delivery Car—Panel Body Type. Capacity 1500 Pounds.

Dealers—Are You Alive to the Money in Delivery Cars?

A complete line of high-grade delivery cars, built by experienced makers, embodying all the most up-to-date engineering ideas, but still selling at a moderate price. No other car combines such striking features, every one of well-proven merit:

Continental Motor—Specially designed for severe commercial use, long stroke, slow speed, 30 H.P., 3¾" x 5¼", three big bearings on crank shaft, cylinders enbloc, recirculating oiling system direct to bearings and gears, valves enclosed, Bosch magneto. Water pump circulation.

Brown-Lipe Selective Transmission—Recognized everywhere as the best; safety latch on reverse. Multiple disc dry plate clutch.

Special Timken Axles—Front and rear, shaft drive, 5 to 1 gear ratio, 17" brakes, two sets, Timken roller bearings used throughout running gear and transmission.

All other mechanical features of equally well recognized quality.

Big Tires—34" x 4" front, 35" x 4½" rear. Quick-detachable demountable rims.

Bodies of New Design—Larger than usual, 7 foot loading space, beautifully finished and well ironed with forgings. Wheelbase, 126".

Everything simple and accessible; all units quickly and easily removable and interchangeable; grease cups throughout; touring car complications eliminated; left-hand steer; center control levers; driver can enter or leave from either side of car.

Do you realize the wonderful possibilities of the light commercial vehicle and are you preparing to meet the demand of the business world with a good, suitable, sellable car?

Or are you still plugging away on the pleasure car and regarding the commercial car as a mere side line?

If you are still thinking that way, Mr. Dealer, read this advertisement carefully and let us tell you a few things the real significance of which you perhaps haven't yet realized.

Competition in the pleasure car business is getting keener every day, while for the high grade delivery car there is practically no competition. In this great field of rich profit the ground has hardly been scratched.

You will find none of the big disadvantages of the pleasure car business. No trading in order to make a sale. No seasons or yearly models. No expensive establishments necessary to make a proper showing alongside other cars. No trouble to locate good prospects. For every man with loads to move or deliveries to make is a possible buyer of a delivery car. And once he has purchased, he is converted to their use and buys more cars of his own accord.

Repeat orders come easy because often a merchant has purchased a Stewart and gotten satisfactory service, he will want all of his equipment to be of the same make and will hesitate before trying out some other make of car, even if it is cheaper in price.

The dealers who get started now are going to get the cream of the delivery car business. As the merchant's business grows he will need more cars. The cars will probably have to be replaced within eight years, the same as horse wagons now have to be replaced within five years. So that this is going to be a perpetual business, and one that will yield handsome year-around profits to the hustler.

Study carefully the features of the Stewart given in the next column and you will realize that this is a strictly high grade car. Write for our catalog and dealers' proposition.

Stewart Motor Corporation, Buffalo, N.Y.

. R. LIPPARD, Pres. and Mgr. R. G. STEWART, Vice-Pres. and Chief Eng. R. P. LENTZ, Sec. and Treas. ROBT. W. INGERSOLL, Sales Mgr.

Separate from and having no connection with the Lippard-Stewart Motor Car Company

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RAYFIELD

The World's Greatest Carburetor Sweeps Field Again



Ralph De Palma.

DE PALMA
HUGHES — MULFORD
VICTORIOUS

ELGIN NATIONAL TROPHY

1st.	De Palma	Mercedes	Rayfield Carburetor
2nd.	Mulford	Knox	Rayfield Carburetor

ELGIN FREE-FOR-ALL

1st.	De Palma	Mercedes	Rayfield Carburetor
2nd.	Bergdoll	Benz	Benz Carburetor
3rd.	Mulford	Knox	Rayfield Carburetor

AURORA TROPHY RACE

1st.	Hughes	Mercer	Rayfield Carburetor
2nd.	Pullen	Mercer	Rayfield Carburetor

The Rayfield is Not a Racing Carburetor. It Wins Because It Meets All Motor Requirements Practically and Positively.

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Distributors in All Leading Cities.

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A New Atwater Kent Ignition System WITH Automatic Spark Advance

This new system, known as the Type K, is noiseless and includes a method of automatically controlling the timing of the spark at any speed from three to seventy miles per hour.

The Type K System is practically silent—much more quiet than a magneto, and gives very much better results. Its efficiency, due to the construction of the contact maker and to the automatic advance, is higher than that of any other ignition device made.

The perfection of this automatic feature is the result of three years of hard engineering work to bring it to its present state of perfection, and we consider it the greatest step in ignition that has been made in several years.



For the last seven years, the Atwater Kent System has held its place as being unquestionably the best battery system in the world. During this time over **seventy-five thousand of our systems have been sold,** and practically all of them are in use to-day. They have not been sold because we coaxed people to buy them, but because one system has sold another.

During the period of the magneto fad, thousands of our friends who formerly used our system and *knew* what it *was*, discarded the magnetos on their new cars and put on the Atwater Kent, claiming they got much better results with much less trouble.

Our manufacturing facilities and reputation have been such that we could have taken advantage of the magneto craze and manufactured magnetos. We could, undoubtedly, have sold large quantities of them, but we knew that our system was better than any magneto that could be built and so stuck to it As a consequence we know more to-day about battery ignition than any other manufacturer.

During the seven years that we have been manufacturing our system we have acknowledged that the magneto had the advantage of us on only one point—it generates its own current and therefore needs no battery, but to-day with the general adoption of electric lighting and therefore a plentiful supply of current from a dependable source which is available for ignition as well, what advantage has the magneto over our system? **Absolutely none!**—and on the other hand, **the Atwater Kent System has many over the magneto.**

This new Tpye K System has been our pet for over three years. Our whole engineering force has been working on it, making one model after another, perfecting, simplifying, cutting down cost of manufacture, and but few have known that we were working on it.

During the past year we have had our entire tool force making tools, fixtures, and machinery for producing this Type K in quantities. We have refrained from making any announcement until we had our factory in such shape that we could make prompt deliveries, realizing that it was useless to announce a good thing until we could give the public prompt delivery and satisfy the unquestionable demand.

The most wonderful feature of the new Type K System is the automatic spark control. A moment's thought will show that the setting of the spark should not be left to the discretion of the operator—at best, he can only guess the proper timing and even if he knew this definitely, he could not constantly shift his sparking lever to get the full efficiency of his motor at all speeds.

Our automatic spark control is really a self advancer and self-retarder. It begins to operate when the car is running at three miles an hour on the high gear and keeps the spark at precisely the proper position at the highest speed the car can possibly run. Below three miles an hour, the spark is at its proper position so that even though it were possible to run the car on high gear at two miles an hour or one-half mile an hour, the spark would always be correct. In the starting position the spark is properly retarded.

Another feature of the Type K System is that the primary circuit is not grounded, the contact maker being thoroughly insulated from the rest of the mechanism. This is of special value when the ignition current is taken from the lighting circuit.

One glance at the Type K will convince you of its unquestionable superiority in workmanship and of its simplicity and sureness of operation. Every manufacturing detail that enters into this system is as near automatic as possible, so that all parts are interchangeable and absolutely perfect.

Write to-day for further information, prices, etc.

ATWATER-KENT MFG. CO., 3947 Stanton Ave., Germantown, Pa.

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"The Horn that's Made for the Discriminating"

TUTO HORN

THE TWO TONE HORN

It Must Be Electrical.

MOTOR cars for 1913 are making use of every electrical device which it is possible to incorporate for the convenience and safety of the car owner.

¶ The electrical warning signal will be the foremost in this electrical equipment list. No amount of argument can prove to the experienced engineer, manufacturer, or car owner that the electrical warning signal can be approached by any other device for ease and safety in signalling.

¶ Heretofore the electric warning signal served merely as a supplement to the bulb horn, and it was necessary to laboriously go from a bulb to a button when this more modern signal was to be operated. In the case of an emergency this action is impossible, due to the great space covered in the small fraction of a second by the motor car.

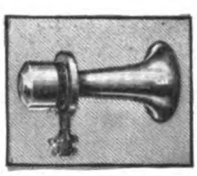
¶ The TUTO horn is the only electrical horn which does all of the signalling of the car, completely displacing the bulb horn and allowing a low note to be produced by a light pressure on the button, and a loud note, for emergencies, by a full pressure on the same button.

¶ This going from the low to the loud note of the TUTO horn is done without thought or movement of the hand. Therefore, the low note can always be used for regular service and if it fails to attract attention, it is always possible to obtain the louder note, even at very close range.

¶ On the other hand the single-loud-note electric horn must be used at all times if it is desirable to obtain the same class of service furnished by the TUTO warning device.

¶ The continual use of the loud note horn is most undesirable or impossible, due to its disturbing nature and to the special legislation which has been enacted in most of the larger cities of this country and abroad.

¶ The TUTO horn does all of the signalling of the car and is furnished complete, so that a permanent installation can be provided. It has been proven best for standard equipment, and it is not out of place to request that your new car be furnished with this signal.



TUTO Horn, $25.00

The Dean Electric Co.

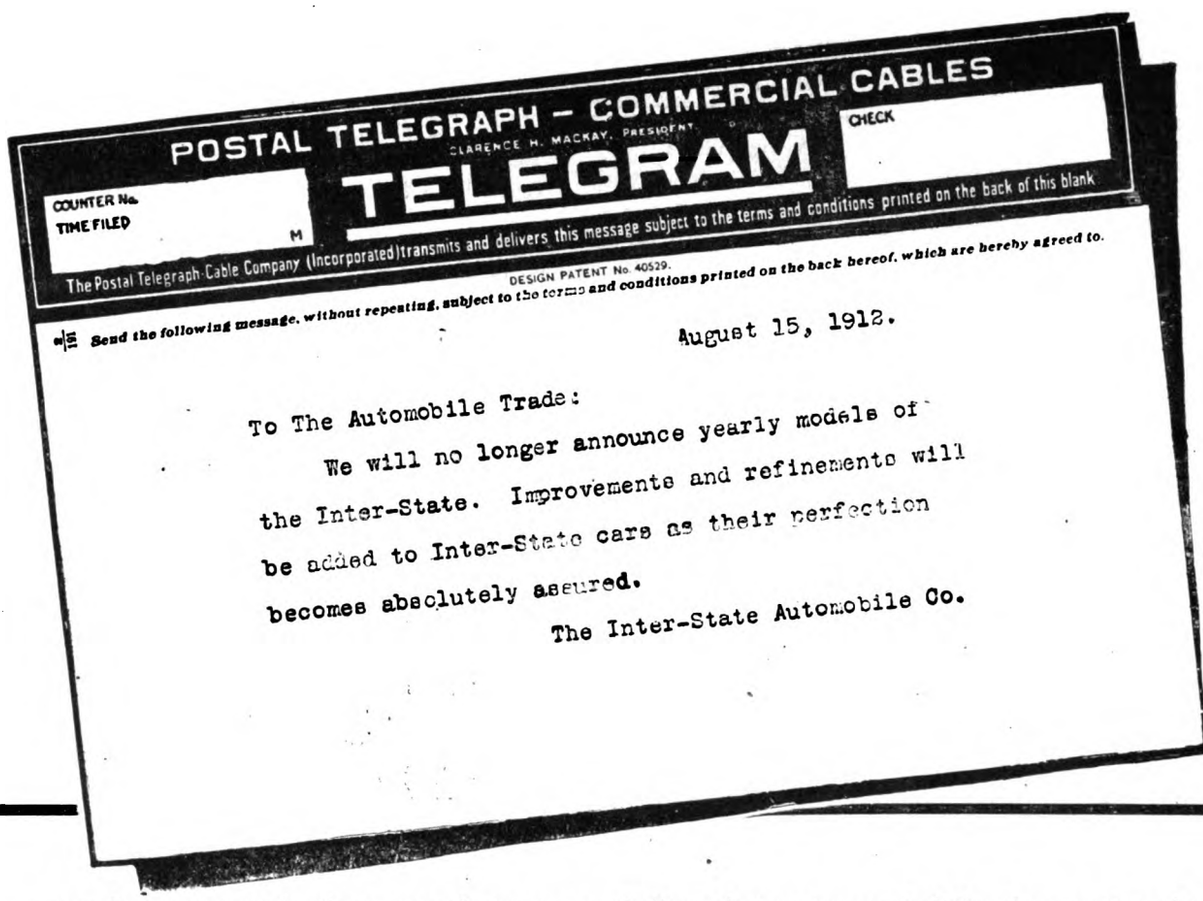
260 Taylor Avenue, Elyria, Ohio

"Look for Dean where Quality's seen"



TUTO-ETTE $17.50

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POSTAL TELEGRAPH – COMMERCIAL CABLES

CLARENCE H. MACKAY, PRESIDENT

TELEGRAM

CHECK

COUNTER No.
TIME FILED M

The Postal Telegraph Cable Company (Incorporated) transmits and delivers this message subject to the terms and conditions printed on the back of this blank.

DESIGN PATENT No. 40529.

Send the following message, without repeating, subject to the terms and conditions printed on the back hereof, which are hereby agreed to.

August 15, 1912.

To The Automobile Trade:

We will no longer announce yearly models of the Inter-State. Improvements and refinements will be added to Inter-State cars as their perfection becomes absolutely assured.

The Inter-State Automobile Co.

As progressive and conscientious manufacturers, we believe that motor car building is a matter of manufacturing supremacy.

We believe the successful motor car builder is one who is careful and discriminating in his selection of those proven refinements which make or mar the long life and satisfactory service of his automobile.

Inter-State cars will continue to be known as cars of distinctive completeness, and any changes in design or equipment will indicate further manufacturing progress, and the proven worth of the changes thus made.

For this reason the Inter-State Company will abandon the practice of "yearly models."

Inter-State cars now ready for shipment include every improvement and refinement known to successful motor car building.

The long stroke motor; cork insert clutch; forced feed oiling system; and full floating rear axle need no expression of merit to an informed trade.

The reliable Inter-State electrical starting and lighting device embodies those efficient principles which insure a positive operation under all engine and weather conditions.

The presence of such a system on the Inter-State is sufficient proof of its merits, and your complete freedom from annoyance and discomfort.

The motor-driven tire pump; the demountable rims; the simplicity of the control, are all evidences of the thought and time and money that have been expended for the complete comfort of the Inter-State owner.

The body and exquisite grace of the Inter-State body lines; the luxurious upholstery; the elegant finish, all speak highly of the Inter-State standard.

The great number of Inter-State owners, who have made the second and third purchase of Inter-State cars, proves conclusively that they cannot buy better, dollar for dollar, anywhere on the market.

The increased production facilities justifies the addition of other high class representation in portions of the country heretofore unoccupied.

It will be worth much to you to be prepared to meet the demand created by our great campaign of national advertising which starts next month.

Will you sell the car that proves its merit on every occasion?

Will you sell the car that includes standard specifications and those improvements and refinements which the buying public now demands?

Inter-State Current Models Now Ready

Model 40 — Five Passenger Touring Car,	**$2400**
Model 41 — Four Passenger Demi Tonneau,	**2400**
Model 42 — Two Passenger Fore Door Roadster,	**2400**

Three distinctive body types on the same chassis, with 40 H. P. En Bloc Motor, 4 1-2-inch bore and 5 1-2-inch stroke.

Model 50 — Seven Passenger Touring Car,	**$3400**
Model 51 — Four Passenger Demi Tonneau,	**3400**
Model 52 — Two Passenger Fore Door Roadster,	**3400**

With 50 H. P. T Head Motor, four cylinder, cast in pairs. 5-inch bore, 6-inch stroke.

Inter-State Automobile Company

409 First Street **Muncie, Indiana**

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"Is right Inside the Flywheel

Otho SYSTEM

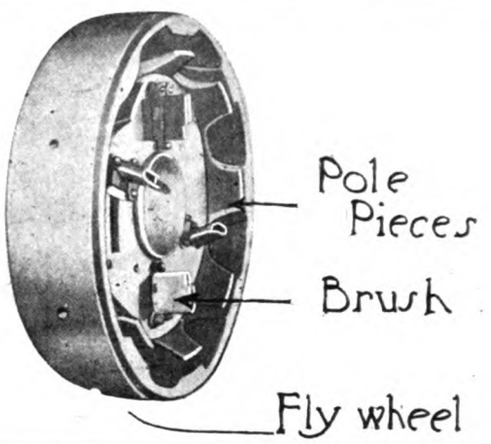
Did you ever see a direct current motor having no moving wires? Here is the only moving part

Here is the armature and field. The stationary parts

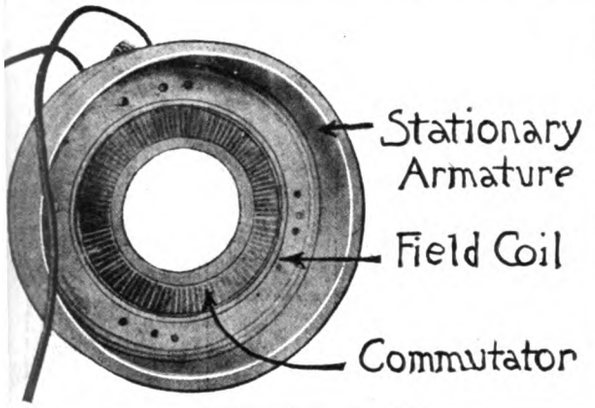
Here is the way they fit together

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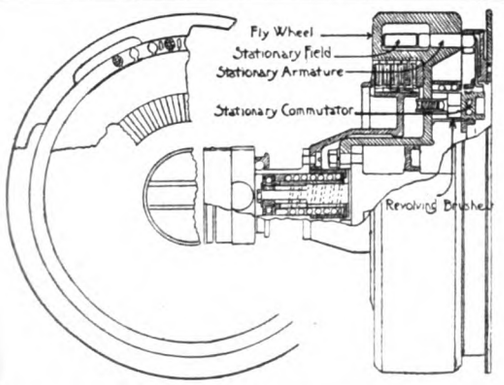
Otho SYSTEM



No. 1



No. 2



No. 3

A direct connected power, light and ignition plant with the engine fly wheel as the only moving member.

The number of inquiries which we have received and the favorable comment resulting upon our introduction of the Otho System of starting, lighting and ignition, convinces us more than ever that we have achieved ultimate succes sin this direction.

Back of this interest stands the original machine itself which has been driven tens of thousands of miles, starting the engine with never a failure—running free at over 75 R. P. M. for as high as twenty minutes—and without reaching the limit.

The illustrations tell the practical part of the story.

Illustration No. 1 shows the fly wheel containing pole pieces and brushes. Please note that this is the only moving part of the dynamo, the field and armature coils being fixed members impervious to injury and certain in action.

When the engine is running normally at from 10 to 35 miles per hour, the moving magnetized fly wheel energizes the stationary armature and produces the current therein.

The current in the generator is picked up by the revolving brushes, two of which engage the commutator as shown in Fig. 2.

Fig. 3 gives a sectional view of the device as assembled and ready for operation.

Remember that your storage system is always kept filled automatically.

We stand ready to demonstrate this device to interested Engineers, Designers and others.

THE OTHO MOTOR COMPANY
60 State Street **BOSTON, MASS.**

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70% MORE TIRE MILES

McCUE WIRE WHEELS

SAVE TIRES

SAVE MONEY

If Wire Wheels Save Tires Under the Terrific Strain of Racing Surely They Will Save More Tires Under Ordinary Touring Conditions.

As another evidence of the fact that wire wheels save tires and enable better motor efficiency we cite again the recent victory of Boillot and his French Grand Prix Winner, the Peugeot car, which won the Mont Ventoux Hill Climb a few days ago. This is a 13 mile hill, the most important and most severe climb abroad, and not only did Boillot win it with a wire wheel equipped car but he made the best speed that has ever been made over the course.

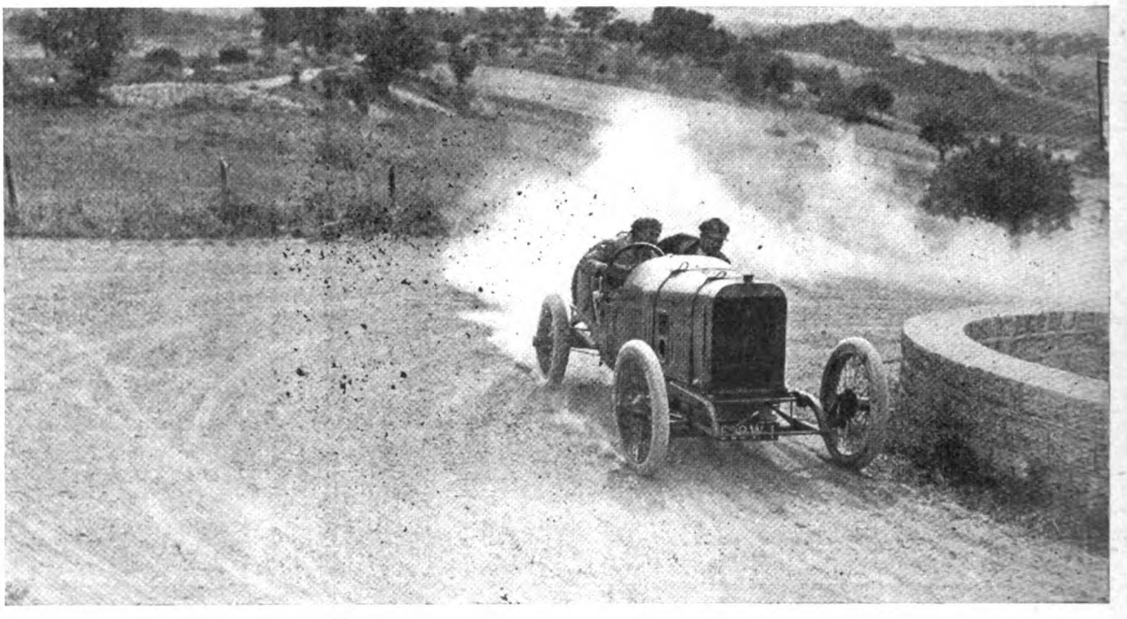
Under ordinary conditions wire wheels for pleasure cars are bound to become popular solely because of their tire saving qualities, but in addition to that they show a general all around increase in car efficiency as compared with cars using wooden wheels.

McCue detachable wire wheels are more easily mounted and demounted than demountable rims. In fact, the change of a McCue detachable wheel is a matter of 30 seconds exclusive of the time consumed in jacking up the car.

McCue axles are so designed as to admit of either wire wheels or wooden wheels on the same spindle. McCue axles not only are designed especially to accommodate the absolute demand for wire wheels, but they are designed with a view of being just a little in advance of all other axles. The rear axle housing, for instance, is made in one piece, from end to end without reinforcement. Several of these housings have been tested by engineers up to 30,000 lbs. on each spring seat without showing a deflection in excess of 3/32 of an inch—a factor of safety of thirty to one. The design is such that the housing forms its own truss, eliminating the usual unsightly truss on other types of axles.

THE McCUE COMPANY, Buffalo, New York

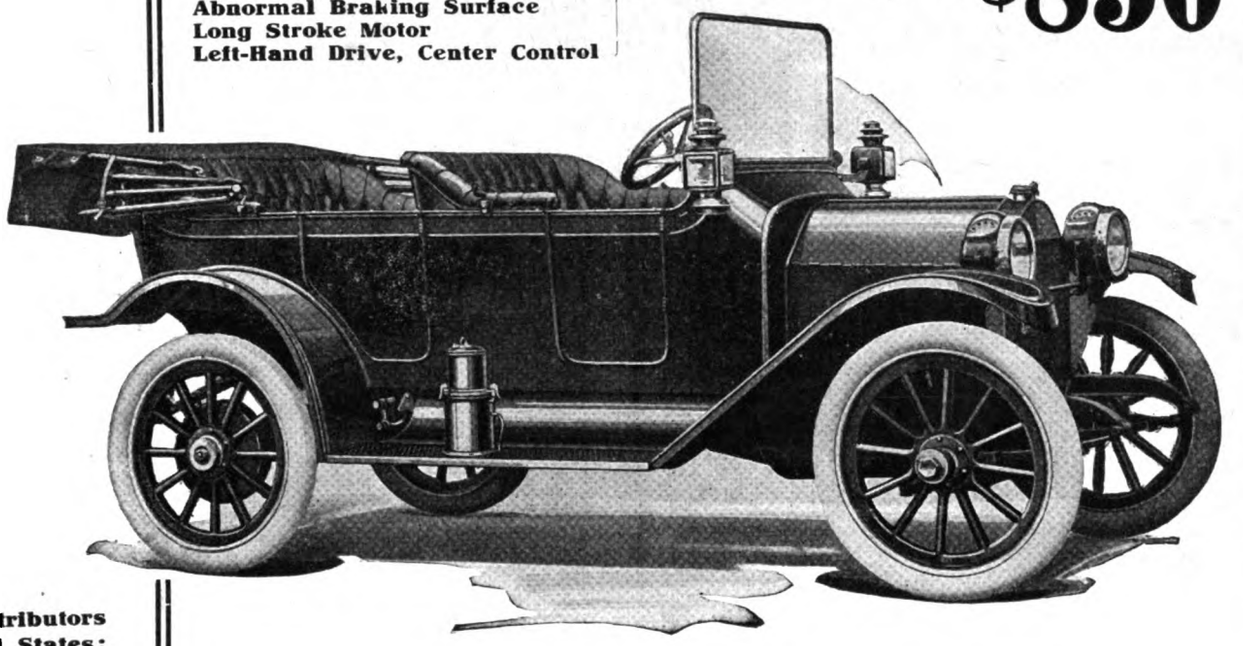
Reproduction below shows Boillot rounding the last turn in the Mont Ventoux Hill Climb.



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Ball Bearing Throughout
Full Floating Rear Axle
Platform Rear Spring
Abnormal Braking Surface
Long Stroke Motor
Left-Hand Drive, Center Control

$850



The Detroiter — an opportunity for a few more dealers

Selling points talk. The DETROITER has them all, plus a price that puts the car in the class everybody wants and can afford. It is the first car—the only car—in the moderate priced field with all those principles of right construction (note them again above) whose absence has heretofore made men spend $1500 or more to get what they knew they ought to have in a car.

Apart from big features, note the equipment:

Model A—$850

Top with Side Curtains. Slip-over Dust Covers. Windshield. Gas and Oil Lamps. Generator. Tire Repair and Tool Kit. Horn. Jack.

Model A-1—$900

Top with Side Curtains. Slip-over Dust Cover. Windshield. Prest-O-Lite Tank and Lamps. Quick Detachable Demountable Rims. Stewart Speedometer, Model 26. Tire Repair and Tool kit. Horn. Jack. Robe Rail. Tire Irons.

Model A-2—$900

Top with Side Curtains. Slip-over Dust Cover. Windshield. Electric Light Outfit (exide battery, combination side and tail light, two head lights). Quick Detachable Demountable Rims. Stewart Speedometer, Model 26. Tire Repair and Tool Kit. Horn. Jack, Robe Rail. Tire Irons.

An increase in our plant—four times as big—allows us to allot additional territory.

Is the Detroiter represented in YOUR territory? If not, act at once.

Briggs-Detroiter Company

449 Holbrook Avenue **Detroit, Michigan**

Principal Distributors for the United States:

BALTIMORE, MD.
Detroiter-Baltimore Co.
BOSTON, MASS.
Andrews-Dykeman Co.
BUFFALO, N. Y.
H. H. Hall,
253 Delaware Ave.
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Barton-Ford Motor Car Co.
DETROIT, MICH.
Barber Motor Sales Co.
INDIANAPOLIS IND.
E. M. Holmes,
111 Kentucky Ave.
JACKSONVILLE, FLA.
Dixie-Detroiter Co.
KANSAS CITY, MO.
W. H. Hathaway.
LOS ANGELES, CAL.
Y. R. Del Valle.
MEMPHIS, TENN.
Southwestern Motor Car Corporation.
MILWAUKEE, WIS.
Oakland-Wisconsin Motor Co.
MINNEAPOLIS, MINN.
Brice Auto Co.
NEW YORK CITY.
Detroiter Company of New York.
OMAHA, NEB.
T. G. Northwall Co.
PHILADELPHIA, PA.
Detroiter Philadelphia Co.
PORTLAND, ORE.
H. L. Keats Auto Co.
ROCHESTER, N. Y.
F. R. Leuscher, Inc.
ST. LOUIS, MO.
Brown Auto Company.
SAN FRANCISCO, CAL.
Carl Christensen.
SYRACUSE, N. Y.
Brighton Garage.
VALLEY CITY, N. D.
Mason Auto Co.
WEBSTER, S. D.
Tyner Garage Co.

400 Other Dealers Throughout the Country.

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Knox

Commercial Vehicles
WIN THE CONFIDENCE OF THEIR OWNERS



FACTORIES
Woodhaven N.Y.
ROLLING MILLS TIN PLATE WORKS AND FOUNDRY
Harrisburg Pa.



BRANCH HOUSES
Chicago Boston

L & G Mfg. Co TRADE MARK

Lalance & Grosjean Mfg Co

CABLE ADDRESS "AGATECLIFF" NEW YORK

690 BROADWAY New York May 24, 1912.

Knox Automobile Company,
1966 Broadway,
New York City.

Gentlemen:-

In reply to your inquiry asking for an expression from us as to our experience in the use of your motor trucks, would state that the fact that we have just placed a new order with you for six 4-cylinder, Model "R-15", 3 ton trucks, should be sufficient evidence that our experience with your trucks in the last five years had been most satisfactory.

We have used Knox motor trucks exclusively for over five years and as we have used no other make, can give no comparison as to the efficiency, up-keep, etc., but it is sufficient to state that our experience with your machines has been so satisfactory we have just placed with you the above order. Our experience with your machines and the courtesies extended by your company have been so satisfactory that we take pleasure in adding our testimonials to the many others you already have.

Very truly yours,
LALANCE & GROSJEAN MFG. CO.

J.H.V./B. President.

Send for Catalogue "W"

KNOX AUTOMOBILE COMPANY, Springfield, Mass.

[New York — BRANCHES — Chicago

"Recognized as America's Highest Standard Since the Beginning of the Industry."

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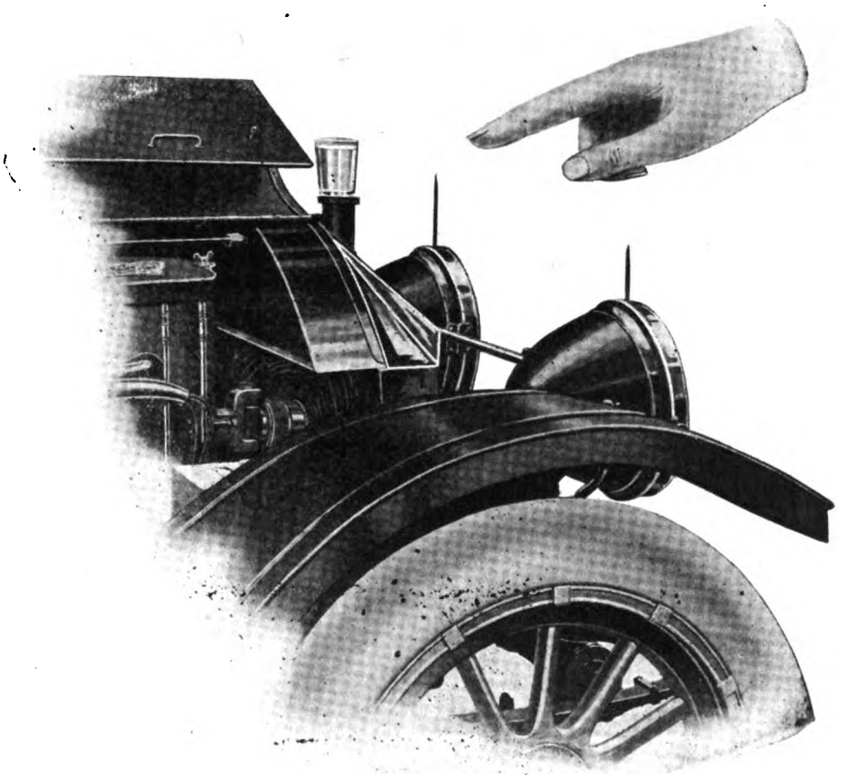
Knox

"Little Six"—The Balanced Car

Aside from its ample reserve power, unexcelled flexibility and rare beauty of design and finish, the new Knox "Little Six," Model 46, embodies many features which mark a new epoch in Motor Car refinement.

One of these highly desirable qualities is correct balance and absence of disagreeable vibration, a result toward which automobile engineers have been striving for years; incorporated as one of the quality "ear marks" of Knox Model 46.

As proof of the above statement we call attention to the following cut showing two pencils balanced on the headlights and a glass of water on the radiator cap with the motor running, taken from an actual photograph.



This is the most exacting test of balance that could possibly be imposed, and proves the thoroughness with which every detail of 1913 Knox cars has been worked out.

Ask for a demonstration of this convincing test at your first opportunity.

Send for Advance Folder of 1913 Models

KNOX AUTOMOBILE COMPANY, Springfield, Mass.

New York – BRANCHES – Chicago

"A Demonstration is Irresistible"

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THE STURDY STUTZ

"THE CAR THAT MADE GOOD IN A DAY"

Announcement of Series B

EVERY *Stutz* owner is loud in his praise of *Stutz* design. Their satisfaction is a reflection of our claim to strong, sturdy construction—construction which we have proven in numerous contests of speed and endurance. We do not care to shout our own praises. We not claim flatly that the *Stutz* is the *best.* We do ask you to compare the *Stutz*—nut by nut, bolt by bolt—with any car built. Compare past performances—then decide.

SIX CYLINDER CARS

The new *Stutz* six-cylinder, six passenger straight line torpedo has 130 inches of wheelbase and a 4¼x5 sixty horsepower motor. Low slung, racy and luxurious in each detail it will make instant appeal to you. The price will make you wonder how we can do it—**$2300.**

There is a six-cylinder roadster too—torpedo body, 124 inch wheelbase—**$2250.**

FOUR CYLINDER CARS

The four cylinder models are not materially changed from the successful Model "A" cars.

The motor is 4¾x5½—T-head as before with minor improvements. Straight line torpedo types are offered exactly the same as the sixes.

We have eliminated with tonneaus. The *Stutz* can only be had in two, four, and six passenger bodies. Passenger weight is more evenly divided and the ugly bulge in the rear is eliminated.

THESE NEW FEATURES

Full electric light equipment with dependable generator and storage battery.
Longer wheel base on touring cars.
Black and nickel trimmings throughout.
Tuto electric horn.
Improved demountable rims.
Water jacketed intake manifold.
4¼ x 5 T-head motor in six cylinder models.

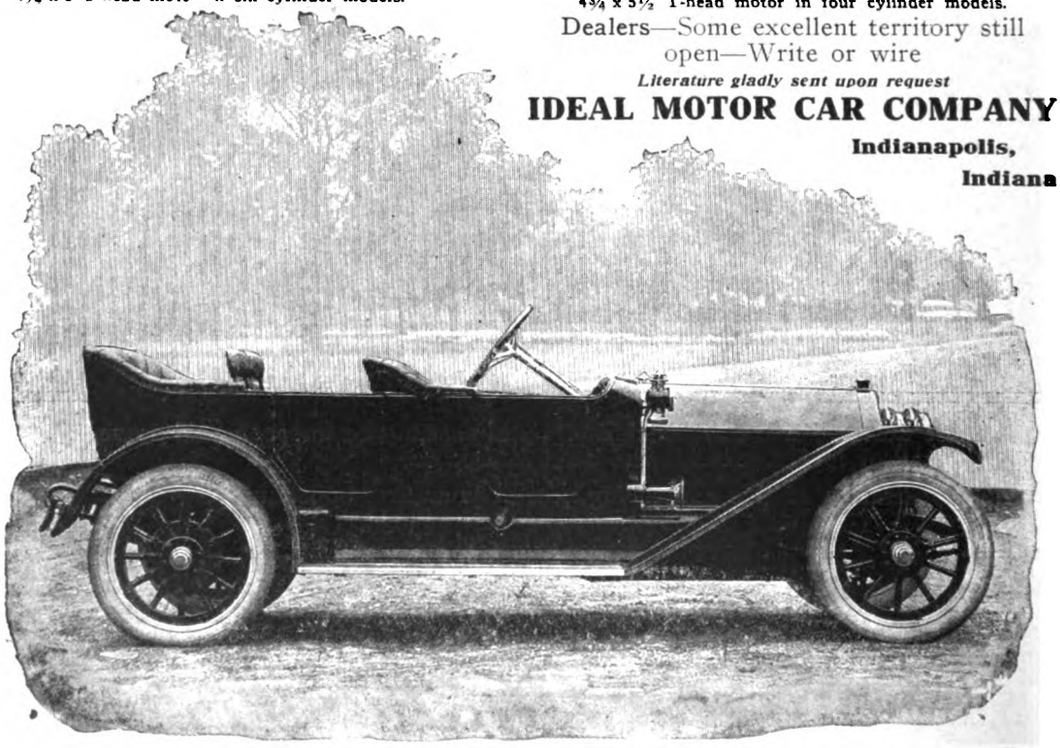
Stutz special rear system with some new exclusive features.
Inside control on all cars.
Velvet auxiliary springs in rear.
Over-size tires.
Gemmer "A" grade steering gear.
Hollow crank oiling system—all ducts cast in crank case.
4¾ x 5½ T-head motor in four cylinder models.

Dealers—Some excellent territory still open—Write or wire

Literature gladly sent upon request

IDEAL MOTOR CAR COMPANY

Indianapolis, Indiana



STUTZ SIX-CYLINDER SIX PASSENGER TOURING CAR $2300

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COMING!!!

STANWELD
RIMS

THE
STANDARD
WELDING
COMPANY
CLEVELAND

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The Dependable Kind - - Made in Germany - - The Dependable Kind - - Made in Germany - -



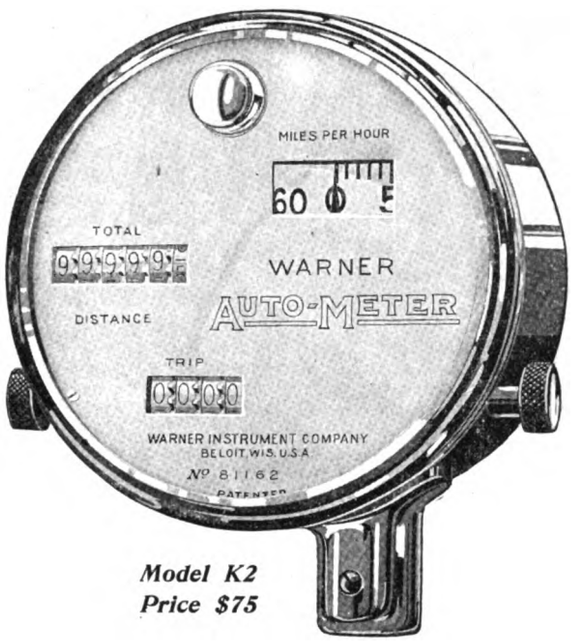
F&S

Annular Ball Bearings

The Dependable Kind - - Made in Germany - - The Dependable Kind - - Made in Germany - -

BRETZ COMPANY
SOLE IMPORTERS
F & S Ball Bearings
250 West Fifty-fourth, New York

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Model K2
Price $75

Warner Auto-Meter

WHEN the matter of speedometer equipment came up for 1913, the leading automobile manufacturers instructed their engineers to pick the BEST speed and mileage indicator made.

They chose the Warner Auto-Meter. The makers thereupon selected this instrument despite its highest price.

This designates the Warner Auto-Meter the OFFICIAL and standard instrument of the motor car world. It has always graced the high priced cars. It is now "regular equipment" on all leading cars. This is official recognition by the entire automobile industry.

This coming season more than 100,000 new cars will be equipped with Warner Auto-Meters. All 1912 contracts have been renewed. It is an unparalleled recognition of merit.

You can rest satisfied if your car bears a Warner. Only cars of known quality pick the HIGH PRICED Warner.

Priced from $50 to $145. For sale at our own branches and leading dealers the world over.

Handsome catalogue on request.

The Warner Instrument Company

Beloit, Wisconsin

BRANCHES:

Atlanta	New York	Philadelphia	Cleveland	Indianapolis	Detroit
Boston	Buffalo	Pittsburgh	Portland, Ore.	Kansas City	Seattle
Los Angeles	Chicago	Cincinnati	San Francisco	Denver	St. Louis

Canadian Branch: 558 Yonge St., Toronto, Ontario

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Abbott

All Models—Electric Self-

UNLIKE many manufacturers, it is our opinion that, in the construction of motor cars, our Engineering and Mechanical Departments should serve the user rather than that the user should be called upon to sacrifice comfort and satisfactory experience in motoring in order to satisfy the inclinations of a sometimes prejudiced Engineering Department.

Abbott-Detroit 1913 models have been planned in such a way as to fully take care of the needs and wishes of Abbott-Detroit owners and dealers, and at the same time comply strictly with the dictates of real, up-to-date engineering and metallurgical practice.

A SIMPLE, STRONG CHASSIS

As will be seen from the illustration (a composite X-ray drawing of the chassis and body), the chassis is free from the large number of rods, wires and numerous other attachments with which most cars, even the highest priced ones, are littered—and yet no necessary parts have been left out. Everything needed for the proper operation of the car is there, but strength has not been sacrificed to simplicity nor reliability to price.

Abbott-Detroit Electric Self-Starter

All 1913 Abbott-Detroit cars are equipped with our own specially designed, self-controlled electric self-starter. Connected to crank shaft with independent train of gears. When gasoline motor starts, over-running clutch releases gears and they remain idle while gasoline motor is running.

Not an experiment—not an attempted combination of ignition, lighting and starting, but a real dependable self-starter, built as a part of the engine, included as regular equipment.

Visit our Salesrooms and have its operation explained.

OIL TEMPERED SPRINGS

Long, semi-elliptic springs in front and three-quarter elliptic scrolls in the rear, made of oil tempered steel, give the body a flexible mounting, which makes it ride exceedingly well, even over the roughest roads.

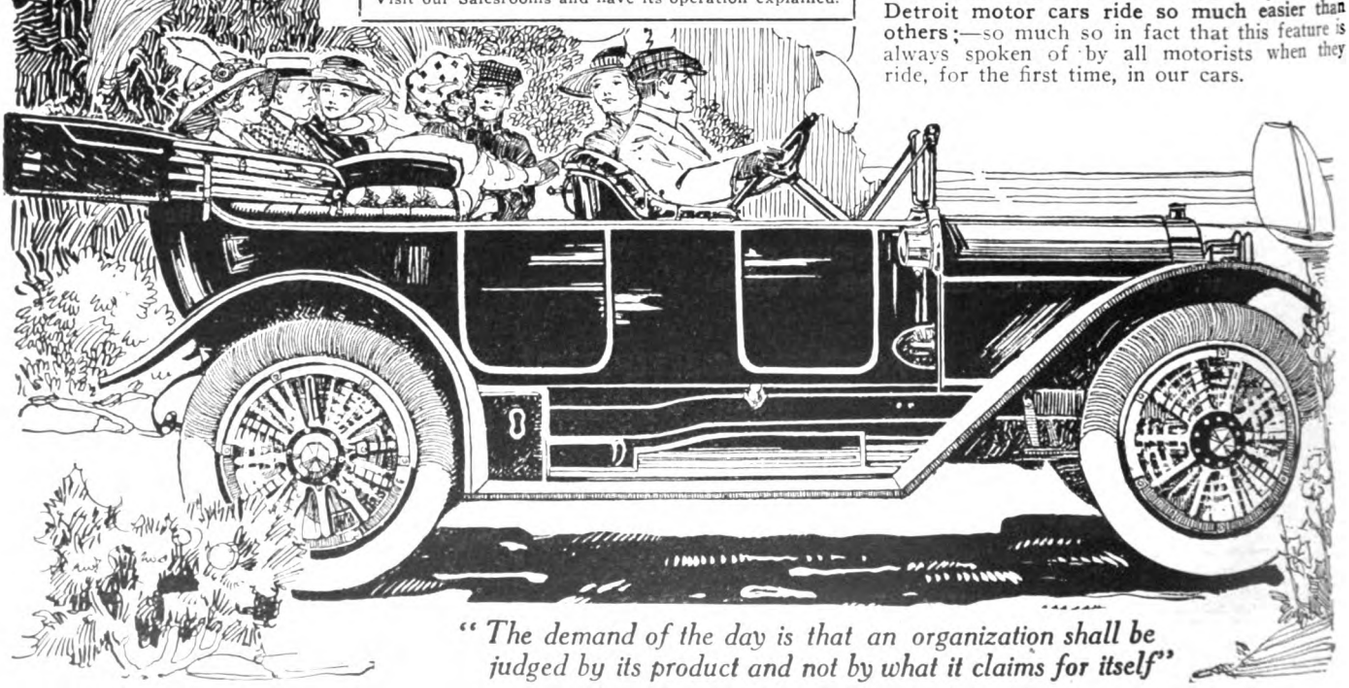
Furthermore, the spring eyes are fitted with bushings and hardened spring bolts of a special design, utilized as grease cups;—this construction reducing wear and insuring perfect lubrication.

RADIUS RODS

Radius rods, which are connected to the rear axle and to a point on the frame, serve to reduce the longitudinal motion at the slip joint in the propeller shaft to a minimum and relieve the springs of a very considerable amount of fore and aft thrust movement which would fall to them otherwise, and provide for the utmost **flexibility** between the body and the chassis, as with this construction we have been able to **shackle the rear springs** at their forward ends. Many manufacturers of cars **fail** to provide radius rods where three-quarter elliptic scroll springs are used and by so doing deprive that system of suspension of a great portion of its flexibility, owing to the fact that the forward ends of the lower springs are in that case, for the purpose of taking the drive of the rear axle, necessarily fastened **rigidly** to the springs instead of being connected with the shackle.

TECHNICAL, BUT VERY IMPORTANT

Although this description is of necessity rather technical, we lay a great deal of emphasis upon it because it shows the **reason why Abbott-Detroit motor cars ride so much easier than others**;—so much so in fact that this feature is always spoken of by all motorists when they ride, for the first time, in our cars.



"The demand of the day is that an organization shall be judged by its product and not by what it claims for itself"

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Detroit

Starter—Electric Lighting

Standard Equipmet.

UNDERSLUNG SPRING CONSTRUCTION

In Abbott-Detroit cars, both sets of springs have been **hung underneath the axles** so that the center of gravity has been lowered to a point well below that usually found on the average motor car. This of course makes for safety and causes the car to hold the road better; eliminates to a large extent any disagreeable side-swaying; has a tendency to prevent excessive skidding; makes it possible for the car to be driven at a greater speed with safety. It lowers the body without decreasing the road clearance or interfering with the spring action.

TORQUE RODS

Torque rods running from the rear axle to the frame relieve the drive shaft, universal joints, drive pinion, gear and axle housing of strain, and also eliminate the bending movement which is wrongly and unjustly imposed upon the springs of many motor cars.

THE FRONT AXLE

The front axle of an "I" beam section is made of drop forge steel, double-heat-treated, and is equipped with a set of Timken roller bearings in each front wheel hub. The steering connecting rods are mounted in a protected position back and above the front axle. Note this carefully. This advantage will be appreciated by those motorists who have driven in mountainous districts or in the sage brush country. The steering connections on many motor cars are hung in front and below, where they are easily injured or where its operation may be seriously affected by brush or wire picked up in the road.

THE REAR AXLE

The rear axle is of the full floating type with nickel steel gears and shafts, Timken roller bearings throughout, except in the wheels, where Schafer imported annular bearings are used.

The housing of the rear axle, of malleable steel construction, is so designed that a vertical cross section parallel to the drive shaft, forms a **complete double truss of great strength and extreme rigidity,** facilitating the proper alignment of the gears continuously after they are once assembled at our plant. This of course reduces friction and noise to a minimum.

LARGE HICKORY ARTILLERY WHEELS

The wheels are made of the best quality of second growth hickory, finished in natural oil. The front wheels have ten spokes, the rear twelve. Also notice the number of bolts used in the wheel flanges.

The felloes are fitted with **Booth demountable rims** and extra large **Goodyear No-Rim-Cut tires.** We have tried, in the designing of the wheels as well as in all other such important parts, to secure the strongest construction possible, believing that the extra dollars spent for the safety of the purchaser would be noticed and appreciated. It would be an easy thing to substitute inferior material and give it a coat of paint, as do some of our competitors, but instead we use good hickory and finish it in natural oil so you can see its high grade character.

Abbott-Detroit cars represent the best that can be produced for the price for which they are sold. We guarantee them for life.

ABBOTT MOTOR CO.
607 Waterloo Street
Detroit, - Michigan



"BUILT FOR PERMANENCE and GUARANTEED FOR LIFE"

Models and Prices

34-40	Fore-Door Roadster, 116-inch wheel base	**$1700**
34-40	5-Passenger, Fore-Door Touring car . . . 116-inch wheel base	**$1700**
44-50	5-Passenger, Fore-Door Demi-Tonneau . 121-inch wheel base	**$1975**
44-50	7-Passenger, Fore-Door Touring car . . . 121-inch wheel base	**$2000**
44-50	Battleship Roadster, 121-inch wheel base	**$2150**
44-50	7-Passenger, Fore-Door Limousine . . . 121-inch wheel base	**$3050**

Advance Catalog on Request

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The War of 1913

The Fierce Fight Raging Among 40-Horsepower Cars

72 Rivals in It

We are nearing the climax in the fiercest fight that Motordom has ever known.

72 makers of cars around 40 horsepower are contending in a fierce struggle for supremacy.

The chief interest centers around six of these cars. For six leaders, backed by millions of money, are each seeking to dominate this great middle field.

The Michigan "40" is one of these six. The ablest engineers have spent four years to fit it for this fight. And it comes this year to claim first place in all this Forty class.

How the War Began

The trend of the times is toward luxurious Forties.

Owners of small cars come to want more power, more comfort, more room, more appearance. Owners of oversize cars come to want more economy.

So the demand for Forties, in recent years, has become overwhelming.

To meet that demand, 72 makers have taken up Forties. Hundreds of the ablest engineers have centered their genius in them.

Today the finest cars ever built in America belong to the Forty class.

Prices Cut in Two

One result has been to bring out in these cars all the best improvements of the past few years.

Another has been to develop comfort and luxury, beyond anything dreamed of a few years ago.

Another result shows in splendid equipment. Each maker has sought to outrival the others. Some cars at twice the price are not equipped like the modern Forties.

But the greatest result is the cutting of prices. Some makers' prices have been cut in two. Forties are selling, with splendid equipment, for what stripped Thirties used to cost.

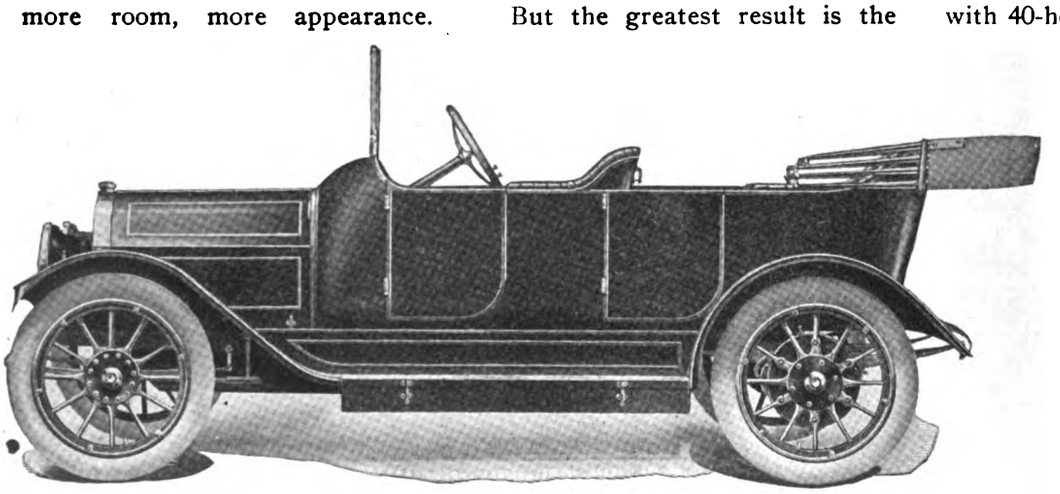
The car which gives the greatest value is bound to win this contest. And every maker knows it.

In quality, equipment, comfort and luxury there are limits beyond which none can go. These limits are reached in the Michigan "40."

Then comes the question of factory efficiency. Who can build such cars for the lowest price? Who dares accept the smallest profit?

Big Saving to Buyers

So this war of the Forties means enormous savings to men who watch out and compare. Cars in no other class match Forties in value. All because there are 72 makers fiercely fighting for favor with 40-horsepower cars.



Michigan "40"—Equipped—$1,585

Michigan "40"

Four Speeds
Extra-Tired
Electric Lighted
Equipped With Every Modern Feature

$1,585

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The Michigan "40"

Electric Lighted—Four Forward Speeds Extra-Tired—Price, $1,585 Equipped

Our Offer is This

We enter this fight this year with a value which no maker ever has matched.

You can easily prove this—in one hour's time. Just make fair comparisons.

We have spent four years in perfecting this car. Some of the ablest engineers have worked year after year on it.

We have made since the start over 300 improvements—71 in the past year.

We have sent out in four years about 5,000 cars, and watched every car's performance. Last year this car, in our test cities, outsold every rival.

The Michigan "40" today represents the last word in motor car engineering.

Cameron's Car

Our designer-in-chief is W. H. Cameron, for years the chief engineer of the Overland.

Our body designer is John A. Campbell, famous all the world over. He has been frequently chosen to design equipages for kings.

Every part and detail is in charge of an expert—the ablest man we could find for the purpose.

To these men we have given more than ample time to bring out the utmost of which they are capable.

We have equipped for them a model factory, with 600,000 square feet of room. And we have backed them with all the money and all the experience gained by 30 years of vehicle building.

The result is this wonderful machine, known as Cameron's Car—one of the finest examples in the world today of the modern motor car.

What It Includes

Mark the price of this car—$1,585. Then note what that price includes.

Note the four forward speeds—a feature heretofore confined to the highest-priced cars.

Note the electric lights and dynamo. This feature as an extra on other cars usually costs $125.

Note the oversize tires—35x4½. The usual tire equipment on Forties costs $50 less.

Send for our catalog and make all the comparisons. Measure up the features, one by one, with all our rival cars. Judge for yourself if any Forty car on the market offers what the Michigan gives.

Then let our local dealer show the car. Take care, for your own sake, to get the utmost advantage out of this fight of the Forties.

MICHIGAN MOTOR CAR COMPANY, Kalamazoo, Mich.

Owned by the owners of the Michigan Buggy Company

Some of the Michigan Features

- Four forward speeds, instead of the usual three speeds.
- Tires 35x4½, instead of the usual 4-inch tires.
- Electric lights with dynamo.
- Electric horn.
- Center control and left-side drive. Both front doors clear.
- Motor 40 to 46 horsepower.
- Extra effective brakes—16x2¼ inches.
- Big, comfortable springs.
- Adjustable steering post.
- Adjustable pedals.
- Firestone demountable rims—extra rim.
- 14-inch cushions—deeper than any rival.
- Rear seat 50 inches inside.
- Hand-buffed leather of the finest grade, filled with the best curled hair.
- Wheel base 118 inches.
- Nickel mountings.
- 50 per cent average over-capacity, allowing big margins of safety.
- Pressed steel, full-floating rear axle.
- Axles sufficient for an 80-horsepower car.
- Best mohair top, side curtains and envelope.
- Windshield built in as a part of body.
- 12½-inch electric headlights.
- Side lights flush with dash.
- Body finished with 22 coats.
- Electric horn.
- $50 speedometer—4-inch dial.
- Special foot rail and robe rail.
- Complete tool equipment.
- Tool chests under running boards. (106)

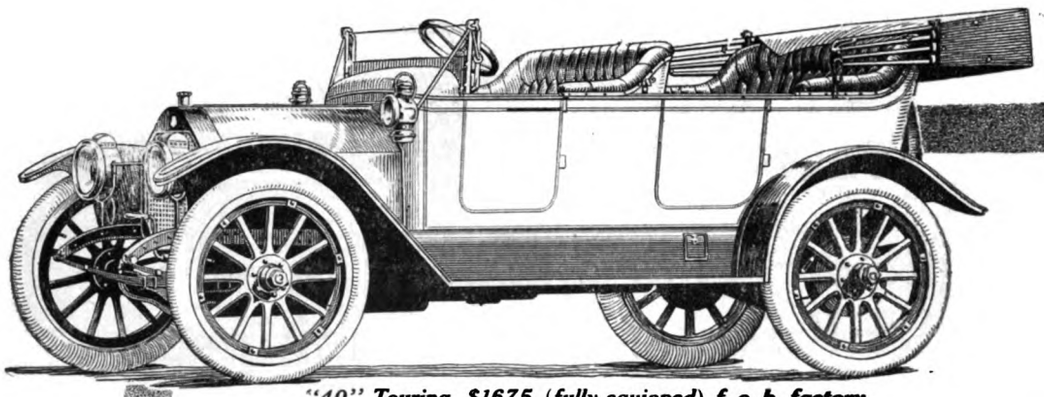
Self-Starter

There is such a difference of opinion about the relative merits of the various types of self-starters, that we have not adopted any one type as regular equipment.

We prefer to leave this selection to the buyer.

However, we equip with either the gas starter or a positively efficient electric starter, at a very moderate extra price.

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"40" Touring, $1675 (fully equipped) f. o. b. factory

1 9 Max

The Greatest Maxwell of Them All

NOTABLE FEATURES

Left hand drive
Center control
Long stroke silent motor
Selective transmission
116-inch wheelbase
36-inch wheels
Demountable rims

French design body
Black and nickel trim
Metal bodies—24 coats of paint and varnish
Roomy tonneau
Turkish cushions
Two front doors
Effective dash ventilators

Self-starter
Stylish mohair top and side curtains
High grade lamp equipment
Electric lights
Concealed horn
Tire carrier and protector
Extra tire rim

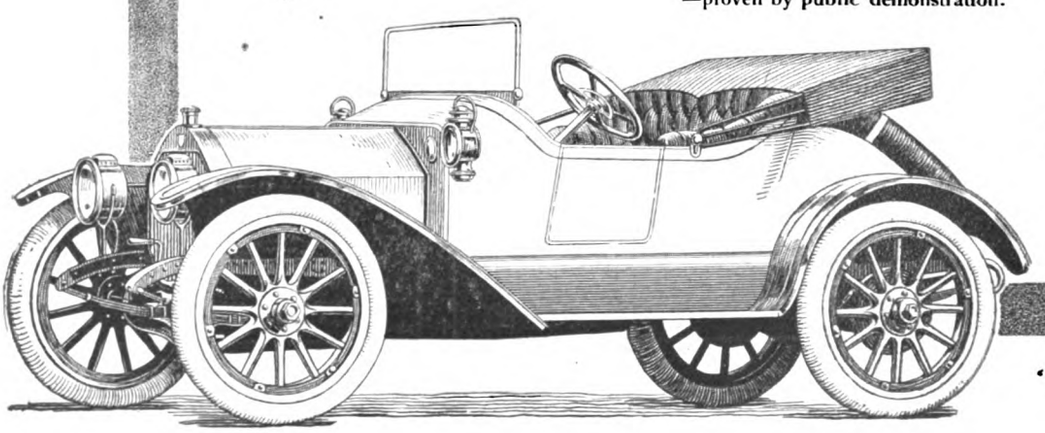
1913's Biggest Value in Three New Models

Beauty, luxury and comfort have been developed to the utmost in the handsome Maxwell "40". Every refinement, every detail, is the very latest. Nothing that would make the Maxwell "40" better has been spared or omitted.

The new 1913 Maxwell is the finest car we have ever built. It is larger, more powerful, finer in every way. But it remains

ECONOMY UNITED STATES MOTOR CO UTILITY

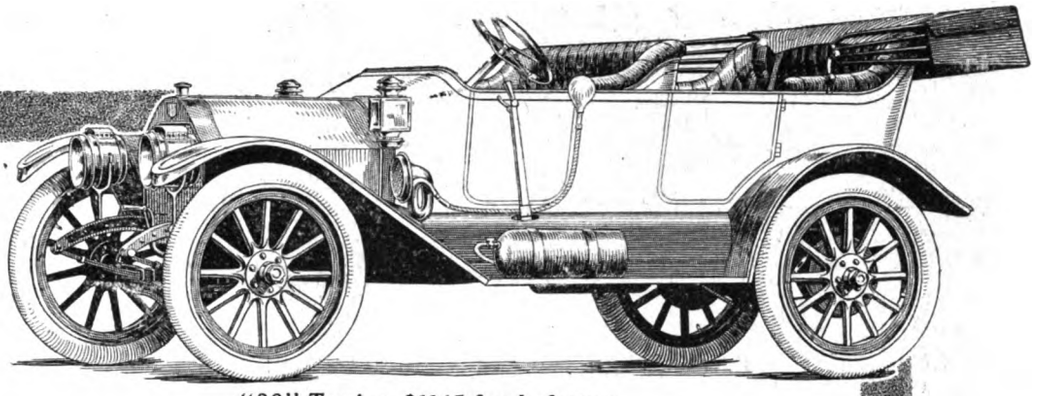
You should buy a Maxwell because—It holds the world's speed record in its class. It is the national touring champion—winner of the Glidden Tour. It lasts longest—proven by actual State registrations. It costs less to maintain—proven by public demonstration.



United States Motor Company
Maxwell Division

"40" Roadster $1625 (fully equipped) f. o. b. factory

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"30" Touring, $1145 f. o. b. factory

1 3 Well

Larger, More Power and Refinements

characteristically a Maxwell. That is, it retains the mechanical features responsible for the extraordinary Maxwell durability, endurance, economy of operation and upkeep.

The "40", is made in two body styles—the touring car $1675 and roadster $1625.

Maxwell "30"

We offer also the "30" touring car $1145 and the "30" roadster $1110. Our "30" made a great hit last year, and we were unable to build enough to supply the demand for it. It is improved and enlarged as the leader has been; and we are confident will retain its supremacy in its class.

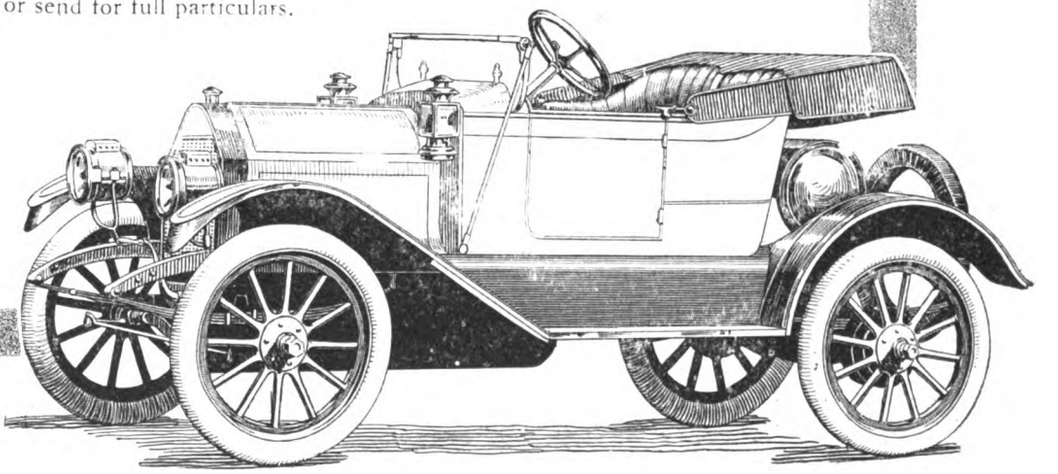
Maxwell "22"

In the new Maxwell "22" we have the spectacular automobile value for 1913. At $785, fully equipped, including self-starter, the "22" will make an instantaneous hit. If you are interested in this model, we urge you to see the car, get a demonstration and make your selection at once to insure delivery. Our entire output of this model for 1913 is already sold to dealers.

Deliveries Now We are ready to demonstrate any of these models and make immediate deliveries. 'Phone or call for appointment, or send for full particulars.

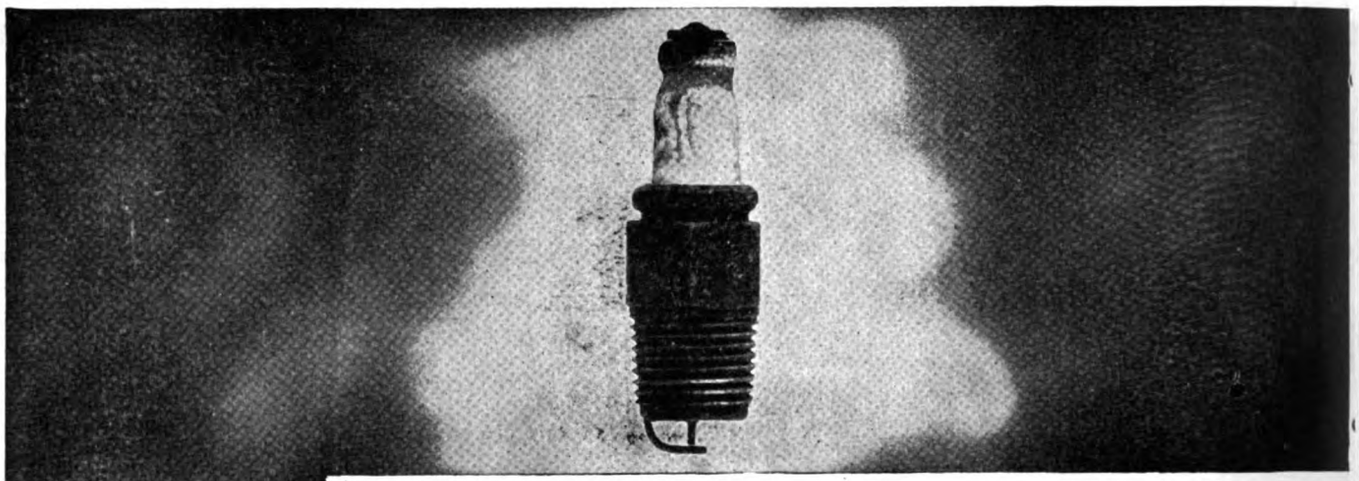
ECONOMY UNITED STATES MOTOR CO UTILITY

1 WEST 61st STREET
NEW YORK
N. Y.



"22" Roadster (fuliy equipped) f. o. b. factory $785

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Jeffery-Dewitt Porcelain Triumphs Again

¶ It takes a hammer to crack a J-D Porcelain. Heat can't do it. Every claim to the superiority of this product has been vindicated—and more—by a new experience. A great motor car factory burned to the ground on the first day of last June. It was the fiercest conflagration ever recorded in the automobile industry. Heavy brick walls crumbled like cardboard; steel rails twisted and curled like glowing serpents along the ground; immense steel girders bent and writhed in the flame; piles of aluminum castings melted into a white hot pool. When the fire had burned itself out, nothing remained but the smoking wreckage of a plant and stock worth half a million. Workmen started in to sort out the junk. Twenty-seven cars ready for shipment had been standing on one of the floors. Their scarred skeletons were found deep in the wreckage where the flames had been hottest.

¶ Every motor had been equipped with J-D Spark Plugs. Not a single porcelain was cracked!

¶ The case-hardened steel of the plugs had no more temper left in it than a piece of putty. The brass caps were melted off. But not a porcelain had suffered a bit of damage, beyond having the enameled lettering half burned away, as is shown in the photographs.

¶ This same quality of porcelain enters into every spark plug produced by the Jeffery-Dewitt Company. When you buy spark plugs again buy the best—The J.D Line—the kind that defy heat, besides being carbon proof, soot proof, oil proof. The Reliance Magneto Plug is supreme on oily engines, and the J-D Visible, an unqualified marvel of construction, locates ignition trouble at a single glance; the former costs **$1.25;** the latter **$1.00.** If your dealer's supply is out, we will mail all you want, prepaid, on receipt of price. Satisfaction guaranteed or your money back.

Get our motorists' classic, "Ignition and Spark Plug Talk." It's full of good pointers and timely information. A new edition it just off the press.

JEFFERY-DEWITT CO., 65 Butler Ave., Detroit, Mich.

Largest Manufacturers of Spark Plugs in the World

In ordering by mail be sure to give the size wanted or make of car.



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A REAL Gas Lamp LIGHTER AT A Low Price $15

Positive Pressure Reduction—Single Operation

Features Not Found in Any Other Lighting Device at the Price

Twelve Reasons Why Your Car Is Not Complete Without a Start-Lite Junior

1—The START-LITE Junior lights gas head lamps from the **driving seat,** making it unnecessary to get out of the car, stop the car or even reduce speed.

2—The START-LITE Junior absolutely **prevents** blowing up lamps or cracking lenses.

3—The START-LITE Junior **tells** you **when** the gas is turned **on** or **off.**

4—The START-LITE Junior **saves gas.** This is done through the use of a regulator coupled to the tank which reduces pressure to two ounces. Also because you can turn out lights when not needed and light them instantly when desired.

5—The START-LITE Junior can be **operated with your foot.** You need not take your hands off the steering wheel or your eyes off the road.

6—The START-LITE Junior makes it **impossible** for you **to get** an accumulation of gas in your lamps **without** a **spark** igniting it. It saves the cost of many new lenses.

7—The START-LITE Junior is proof against all climatic conditions.

8—The START-LITE Junior **will last longer than your car.** It is trouble proof.

9—The START-LITE Junior **will pay for itself** in one season on gas saved.

10—The START-LITE Junior is a source of convenience and comfort. It **adds real pleasure** to motoring.

11—The START-LITE Junior cannot be tampered with by the small boy or the curious passer-by.

12—The START-LITE Junior is sold on a **positive "Money back" Guarantee.**

DEALERS **We need not tell you what to do. You know START-LITE Quality is highest—you know START-LITE Guarantee means protection to you and your customers. If you are wise you will get busy. TODAY—NOW.**

1502 B Michigan Ave. THE START-LITE COMPANY **CHICAGO, ILL.**

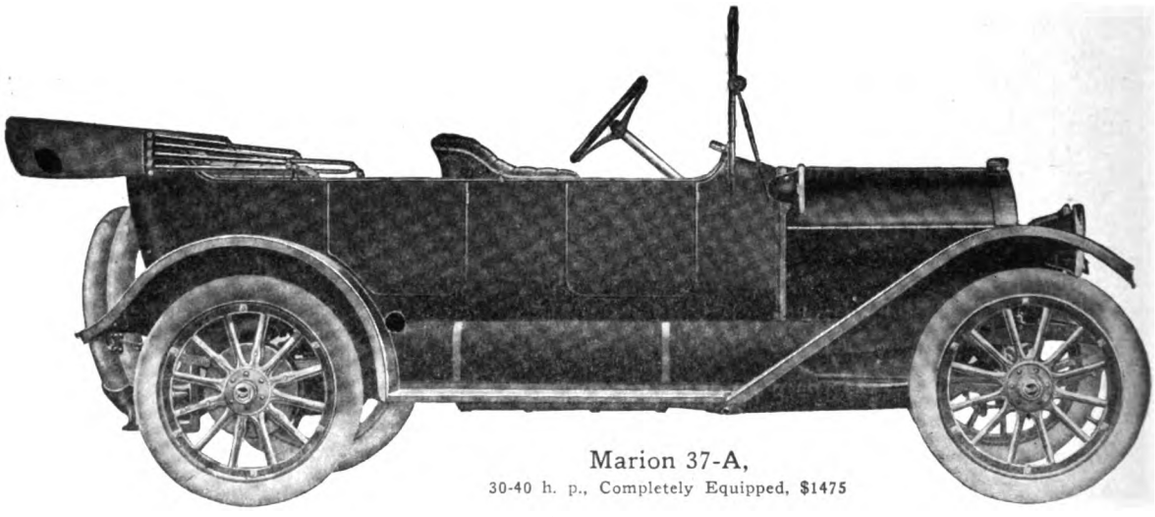
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1913 Marion $1475

37-A

Completely Equipped

Disco self-starter
Prest-O-Lite tank
Warner speedometer
Center control
Deep upholstering
Dynamo electric lighting system
Q. D. demountable rims, one extra
Ventilating plate glass windshield
Brewster green or deep wine colors
Mohair top, boot, storm curtains
80-hour storage battery
Nickel plated trimmings
Concealed tool boxes
Tire irons, tools, tire kit
112-inch wheelbase



Marion 37-A,
30-40 h. p., Completely Equipped, $1475

Here is the car which has caused the expansion of the Marion Motor Car Company. It is the car which will answer the actual demand of recent years for more Marion cars annually.

The Marion 37-A is representative of 10 years of Marion success. You'll enthuse over it. It has Style. Distinction and Class heretofore unknown among popular priced cars. You'll find its equipment unequalled, either in quality or comprehensiveness. Everything is included.

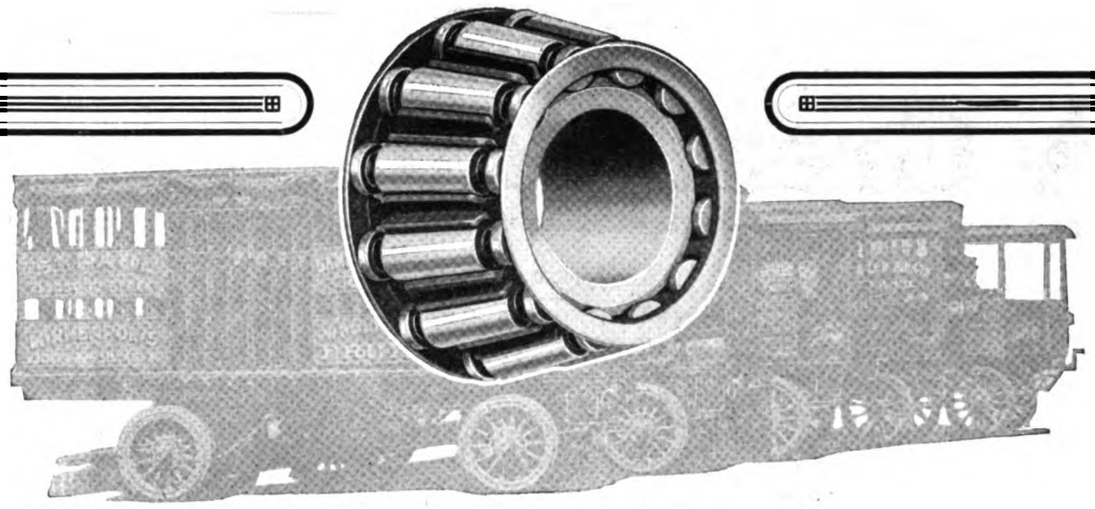
Its motor is powerful, silent and economical. Long wheelbase, springs of finest imported steel, and deep comfortable upholstering insure easy riding. Self-starter, center control, electric lights, demountable rims, and other appointments make motoring in a Marion most delightful. Buy a Marion for your family.

Write for illustrated description of the Marion 37-A and other models. Just say on a postal, "Send advance folder." Write it today.

To automobile dealers we offer the fairest sales agreement that has ever been written. Ask us about territory.

MARION MOTOR CAR COMPANY, 918 Oliver Ave., Indianapolis

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Highest Profits from Motor-Trucks

YOU call for the figures and facts when you consider supplanting horse-drawn wagons with motor-trucks.

Don't overlook facts about the bearings, for bearings have a lot to do with cost of upkeep and with getting full mileage value from the gasoline.

TIMKEN
TAPERED ROLLER BEARINGS

Most of the early truck-builders have come to Timken Bearings after exhaustive tests of other kinds. Most of those who entered the field later have adopted Timken from the start.

From commercial car users, who keep careful figures of upkeep cost, you can learn that Timken Roller Bearings stand up wonderfully well to the gruelling service of the motor-truck.

This is due first of all to the unique principles of the Timken. The heavy load is carried along the length of rollers, not concentrated on the points of balls.

Pressure and hence wear are less because of this distribution. So are the effects of shocks and vibration due to rough roads. End thrust is met because the rollers and cone and cup are tapered. The wear that will come in any revolving parts can be wholly taken up by adjustment, by merely moving the cone farther into the cup.

Timken cones have two ribs that act as a track and keep rollers always aligned. Minute wear is uniform over all the parts and adjustment brings them into the same perfect relation to each other that existed when the bearing was made. Not a single principle of efficiency is altered.

Call for the Bearing facts. You can get them in the "Timken Primer on the Care and Character of Bearings." Write for a copy, sent free postpaid.

The Timken Roller Bearing Company

Canton, Ohio, U. S. A.

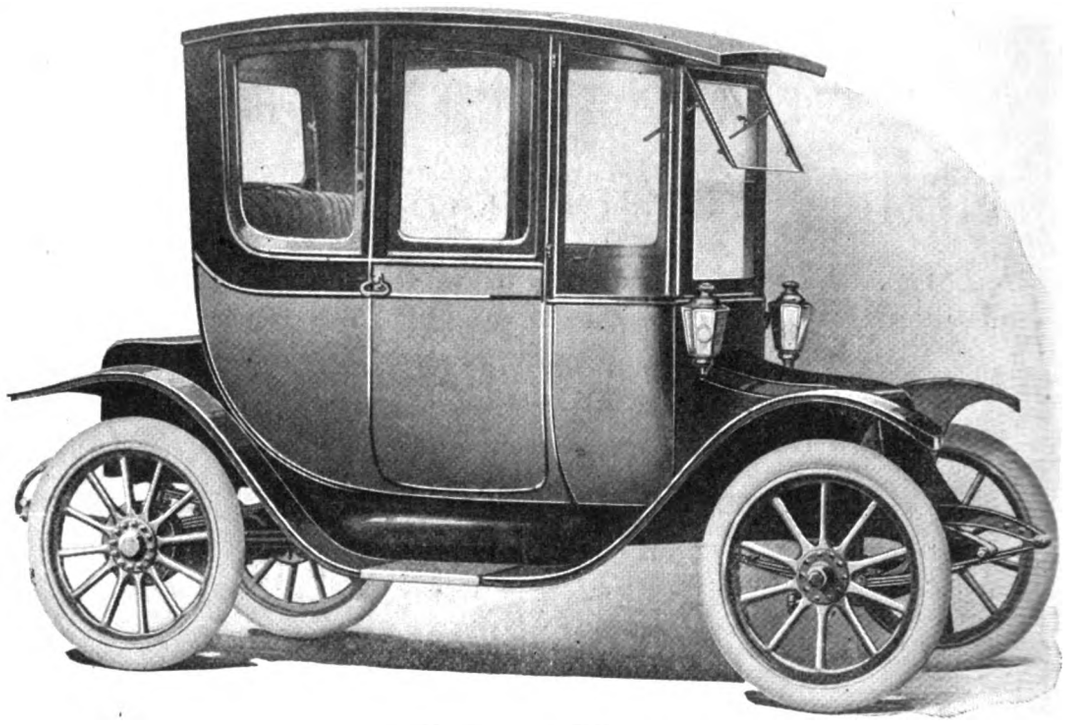
The only axle manufacturer licensed to make automobile axles equipped with Timken Roller Bearings is the Timken-Detroit Axle Company

115

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A Great Endorsement

How Competitors "Talk" About



The Standard Electrique

THE BEST WAY to find out whether your business competitors ***are afraid*** of you is to know "what" they ***say*** about you. If they publicly eulogize you or loudly whisper flattering things about you, that is the time to beware, for man is the only animal that hides his tracks. But when your business competitors do and say everything they think unto themselves will hurt you, obstruct your success, disparage your efforts, that is high season to celebrate their discomfiture.

SO THIS ADVERTISEMENT is going to be a public justification of an enviable position—a kind of tribute unto ourselves, as it were, shared by the people of this great city, for in the nature of our business we are caterers ***to*** the public and in a measure servants ***of*** the public; therefore, we have a right to take the public into our confidence, to assert and justify the published statements we have made regarding the supremacy and unique distinction of the product we manufacture and of our position as manufacturers in the business world.

RECENTLY WE PUBLISHED an advertisement entitled "The Truth About Electrics, How to Save $1,000". The unanswerable argument therein presented created consternation among our competitors, because it was in the nature of a challenge, for the advent of the Standard Electrique was the beginning of a new era in the making and selling of Electrics—an era of opportunity to possess the comforts and conveniences this type of car presents (but not at a fancy price investment); moreover, to own a car which in its purchase cost involves at least the saving of $1,000 and, what is still more important, a car that in efficiency of operation and advanced simplicity of construction is positively superior to many of the so-called best cars upon the market.

THEN BEGAN THE OPPOSITION, not openly, because that would bring ridicule upon those whom for want of a more definite description we term competitors, but covertly, insidiously. This is what a purchaser of a Standard Electrique was told upon Automobile Row by our "rivals"(?): "Whatever you do, don't buy a Standard. Why, don't you know that the car is new and untried, that you are speculating with your money, because ***we*** know that the car won't stand up—its construction is all wrong? The company, too—why, it's a very small affair," etc., etc., etc.

HISTORY REPEATS ITSELF. Progress has always had to fight battles. Genius has ever had enemies. When Alexander Graham Bell told the world of the telephone he was openly ridiculed. In a humbler way, the supe-

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riorities of construction in the chassis of the Standard Electrique is likewise honored. For it *is* an honor to produce an Electric that in advanced engineering excellence and revolutionary low price can create such a stir and shake the very foundations of a business which for too long a period of time has been very nearly a monopoly for the manufacturer, because of prohibitive prices, when by every conceivable argument the Electric should in high quality and low prices be within the reach of the family of moderate income.

NOW, LET US PROVE that the Standard Electrique, by reason of its inherent superior qualities, sustains the opposing truth to all the "knocks" our envious competitors give it. Is it a new and untried car? Will the Standard stand up through years of service? Let us answer explicitly. The men who designed and the men who manufacture the Standard Electrique have no peers in experience in this branch of the automobile industry. Mr. Neracher, who designed the chassis, is consulting engineer of the Overland Company. Mr. Forrer, the electrical engineer, was for many years associated with the Westinghouse Company, while Mr. Krueger, the general manager of the Standard Electric Car Company, is recognized in inner circles of the trade as the best informed and the most earnestly aggressive exponent of the Electric in the country.

THE CAR ITSELF SHALL BEAR WITNESS. What is there about the Standard Electrique which has caused such an upheaval in the trade? Is it a new and untried car? What is the secret of this "rumpus" among our competitors? Take your engineer friend to our showroom to examine the chassis and he will tell you the truth. He will tell you that here is "construction" infinitely more simple, therefore more efficient, than you can possibly find elsewhere. He will show you at last thirteen points of superiority over other "Electric" chasses. He, being unbiased—therefore honest—will tell you that the reduction gears, with their silent operation and the seiveled motor and the remarkably strong and simple rear axle construction, are indeed "advancements", not innovations, but the principles of applied mechanics, improved, made more perfect to fulfill the purpose of their duty.

THEN, THE NEWNESS OF THE STANDARD ELECTRIQUE! It *is* a new car and we are most proud of it. In the concentration of our ideals as to what should constitute a perfect Electric, we were not hampered by tradition. We did not have to add "makeshifts" to bring our car up to date, to discard chain-drive for shaft-drive, also to conform to refinement of body design because competition demanded it. There is no "wreckage" behind the Standard. The field was clear and our course well defined. All that our ripe experience knew to be "proven best" we freely accepted, added to it improvements and many exclusive features. Then we ran our models thousands of miles, over city streets and country roads, gave them harder usage than they could ever get under any other circumstances, and the result is the Standard Electrique, the newest car upon the market in superiority, and the best, most thoroughly tried of them all.

OUR UNPRECEDENTED GROWTH. In business the proof of the quality of a product is measured by the volume of its acceptance by the dealer and consumer. In the exploitation of Electrics the field has been limited for reasons which we have stated, chief of which has been "prohibitive high price." The Standard Electrique made its first appeal to public estimation just one year ago, and immediately the first drafts of our design reached the hands of dealers we were besieged with applications for representation. They are the men who "know" the "good thing" when they see it. We were placed in the unique position of being able to pick our dealers—many of whom were then representing well-known Electrics. Today we have on our books orders for over one thousand cars, a number which exceeds the total yearly output of many old established factories.

OUR PLACE AS MANUFACTURERS. As the men who build the Standard Electrique are old in experience, progressive in achievement and absolutely resolved the "Standard" shall always be the leading "quality" Electric, so, also, are the men who are financially responsible as manufacturers for the opportunity the car presents the public. The Standard Electric Car Company will be doing business as long as the Electric as a method of convenient and pleasurable locomotion exists. Emerson once said, "Let a man build a better mouse trap than his neighbor, and whether he live in a forest all paths will lead to his door." This is supremely applicable to our business. To every intelligent buyer of an Electric who is wise enough to want something more than a name and who does not desire to squander money wantonly upon his car, the path of purchase will lead inevitably to a Standard Electrique. Because the Standard Electrique is a superior car, it is fast becoming the "out-selling" car. We are now making plans for the addition of another factory to our already large plant. The reason is obvious.

WE WELCOME COMPETITION—straightforward, honest competition, the kind of rivalry that sells products upon their merits. The wide-awake buyer now buys upon comparison. He matches one thing against another thing, weighs them in his judgment, discounts claims against known facts. Especially is this so in buying automobiles. The oily-tongued salesman cannot get by on "bluff" today—the public is too well informed. Neither can he do business, creditable business, on misrepresentation. If a man cannot sell the car he is paid to sell except by disparaging other cars, then, by every argument, what he is trying to sell isn't worth buying, neither is he earning an honest living, for if he is not deceiving his employer he is deceiving the customer, and of the two evils the latter is the greater. Caveat emptor—Let the buyer beware.

COMPARE THE STANDARD ELECTRIQUE with other Electrics. We do not desire to sell a single car except on that basis. We want our chassis, inch by inch, compared with other chasses. We want our equipment—Exide Batteries (30 cells, 11 plate M. V.), Westinghouse Motor (series wound), Parish and Bingham Frames, Hayes Wheels, Tires, Goodyear or Mots, compared with other offerings. We desire you to compare the simplicity of our chassis, the efficiency of it, its direct line shaft drive, its necked-in and dropped frame (made so much of as special features in other 1913 announcements), its simple, powerful and noiseless reduction gears, with the construction of other cars. Why, we could ask you $2,885 instead of $1,885 and you would gladly buy a Standard Electrique.

HIGHEST QUALITY, LOWEST PRICE is our argument. We believe that the "Electric" is destined to be just as popular as the gasoline car. We know by reason of a tremendous growth in popularity that the Electric which meets the test of supreme quality, sold at a reasonable price, will outsell all the "too high priced" cars. So we decided to share with the public the profits we could have made for ourselves, to give every purchaser of a Standard Electrique as good as money can buy and a better car constructionally. That is why the price caused excitement all over the country. $1,885 is now the first and last cost of the one Electric that has adjusted all existing standards of value and positively compelled our competitors to use every means in their power to defeat the competition they know too well they cannot possibly meet.

SERVICE AND GUARANTEE: Immediately you become the owner of a Standard Electrique our representatives are always at your service. The "service" behind the car is just as important to us as the "service" built into it. Our interest, expressed in terms of organized, specialized ability to see to it that every "Standard" is always 100 percent efficient, adds to the remarkable value of this car. Every Standard Electrique is positively guaranteed by the factory through the local or territorial representatives.

Here's a dealer's opportunity that has never been equaled in the automobile industry

The Standard Electric Car Company

(Factories) Jackson, Michigan

(10)

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"MADE TO MAKE GOOD AND DOES"

THE M & P Electric one ton truck is a tried, proven and found good machine, selling for $1500 to $1600 and giving dollar for dollar more and better service than the mediocre gasoline truck at a price much higher.

This vehicle is not an experiment—but a powerful, easily operated and speedy delivery car, with operating cost far below that of the higher priced internal combustion truck.

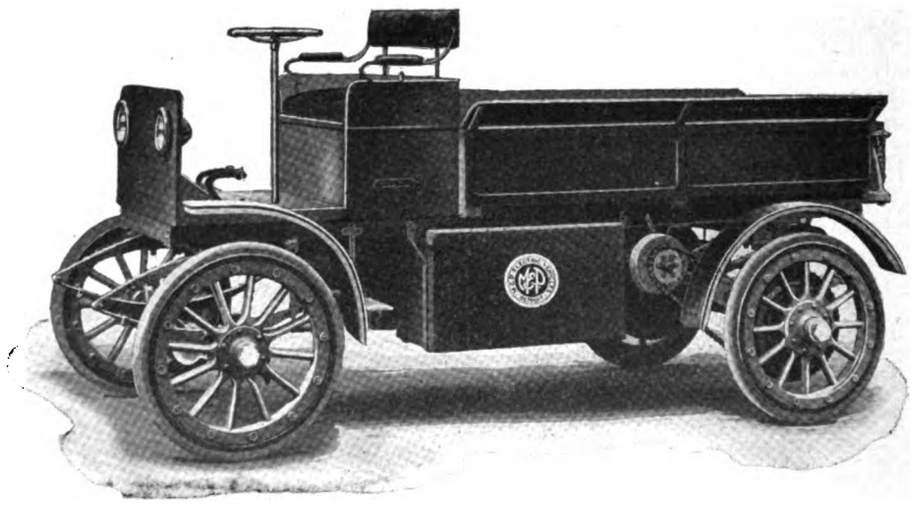
We find that it is striking a popular chord among a great number of business men who have been looking for an economical and speedy delivery method that could be had without an excessive initial cost outlay.

Our dealers are successful—our customers are well pleased—because this handsome, sturdy vehicle is making good wherever sold.

The M & P Electric one ton truck embodies simplified design and high grade material which make the prices from $1500 to $1600 clear out of proportion to its working value—and you cannot side-step the fact that it gives service far in excess to that of high priced gasoline trucks.

The proof of this is at your disposal, Mr. Dealer, the minute you want it. Write and make us make good our claim. The returns from your inquiry will be satisfactory.

THE PRICES { **Chassis . . . $1450** / **Express Body . $1500** / **Enclosed Body, $1600**



THE M. & P. ELECTRIC VEHICLE COMPANY
Franklin and DuBois Sts. Detroit, Mich.

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FRANKLIN "LITTLE SIX"

A 30 Horse Power Six-cylinder Car $2800

A new type of car—a small powered six.

Some sixes weigh nearly twice as much.

No other weighs so little nor is so compact.

Motor is only thirty horse-power—a big motor is not required in a small car.

In a motor so small, the flexibility and smooth running of six-cylinder construction are very pronounced.

Announcements of "1913" models show that nearly all sixes are running to heavy weight and high power. This means harder driving, less comfort and increased cost.

The Franklin "Little Six" is the other type—light construction, resilient, medium powered—easy to drive, comfortable to ride in and economical to run.

The extreme satisfaction derived from light weight and medium size makes the "Little Six" a universal car.

Beauty of design is another characteristic of the "Little Six." The lines of the smooth flush-sided body blend perfectly with the sloping hood.

Franklin direct cooling reduces complication and increases efficiency. Nothing to freeze in winter, no boiling or overheating in summer.

> The Quaker City Motor Club barred air cooled cars out of their economy contest. This is a good thing to bear in mind, if you are ever called upon to compare the relative efficiency of water-cooled and air-cooled cars.

Lubrication is by re-circulating system. One gallon to four hundred miles of running is the average oil consumption. Smoking is entirely done away with.

Send for "Little Six" booklet. Catalogue of all models mailed on request.

FRANKLIN AUTOMOBILE COMPANY

Syracuse N Y

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350,000 Fours

will be built in 1913. And all the country clamoring for SIXES.
To meet the demand only

10,000 Sixes

Will be built by all of the makers who have had a successful SIX
on the market more than two years.

And All the Country Clamoring for Proven Sixes!

Are you going to try to resist the tide of Public Opinion, or are you in line to take advantage of its golden flood? The satisfactory business of this year will be done by those who have SIXES—SIXES that the public know are right and representing great value. But unless the SIX is a proven SIX—or past the experimental stage—you had better stick to the Fours, and make the best of it, for a poor SIX, like the early Four, the SIX which is untried, will cost to keep going more than you can make. But you don't have to take this chance; there will be 10,000 proven SIXES made this year. PREMIER is only one of the five leaders to meet this demand, and perhaps your territory is open.

PREMIER has been building SIXES seven years. There are no mechanical bugs in SIX PREMIERS.

PREMIER SIXES will hold and develop your trade. Over 95% of our six cylinder owners still drive their same SIX PREMIERS.

PREMIER SIXES were used as Pathfinders, Pacemakers and Pilots in 1911 "Ocean to Ocean" and 1907-8-9 Three "A" tours, as well as in many of the other great endurance tests in America.

No car has been more thoroughly proven than PREMIER.

PREMIER is America's Greatest Touring Car.

Remember that in the famous "Ocean to Ocean" Tour of last year, that it was twelve PREMIERS in the hands of their owners, one driving a 1909, five 1910s, six 1911s, which crossed the continent from the Atlantic to the Pacific, 4763 miles, making all controls on time and with perfect mechanical scores.

Premier is the Six for You This Year

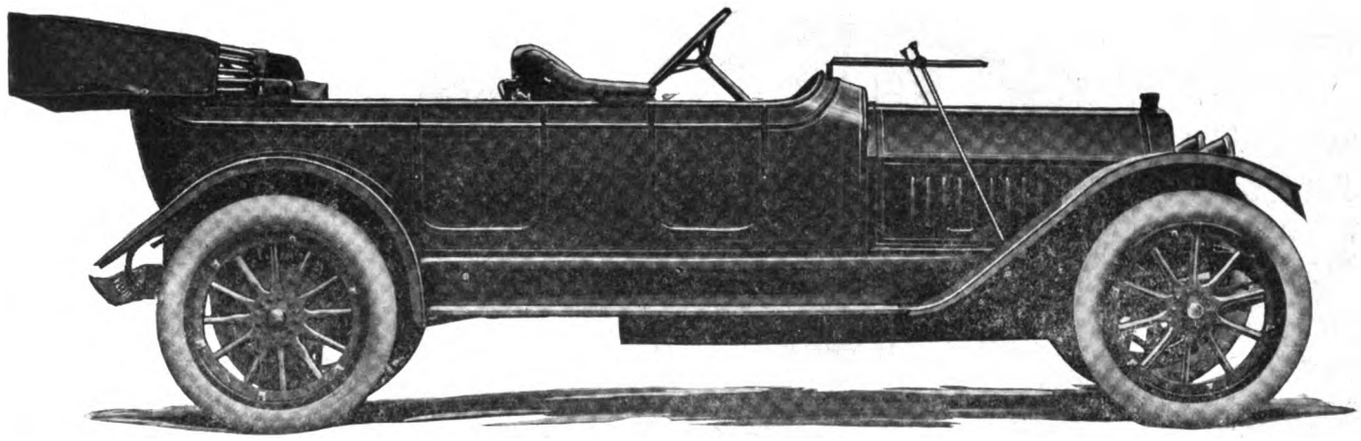
Delivery to dealers at once. To the public, October first.

The PREMIER LITTLE SIX at $2600 is a reality, not a promise. You can buy and sell them today.

Remember PREMIER has always been of the highest grade, and there has never been a better PREMIER than is being offered for 1913. We have merely with the Little Six established a new price basis for high grade automobiles.

Premier Motor Manufacturing Company Indianapolis

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Specifications for the $2600 Little Six Premier

MOTOR—Six cylinders, cast in triplets, T-head type conventional among high-grade cars, valves on opposite sides, bore 4 inches, stroke 5 inches.

POSITIVE STARTER—The New Six Premier carries the most positive starting device that has up to this time been developed. It is of the pneumatic type sufficiently powerful to spin the motor at high speed, thereby producing sufficient pull to lift the gases in coldest weather. It is not necessary to run the car to charge the compression tank, which operation is noiseless. This eliminates the greatest inconvenience of modern motoring. It is only necessary to press the button to start.

TIRE INFLATOR—Premier equipment of Firestone demountable rims where extra tires can be carried filled with air greatly reduced the inconvenience resulting from the punctured tire, but with the New Little Six Premier this is entirely eliminated by the addition of a tire inflator which has sufficient capacity to at all times supply compressed air for the inflation of your own or the other fellow's tires.

ELECTRIC LIGHTS—Electric lighted throughout by a special generator, a simple, uncomplicated, automatically-controlled, generating unit which has nothing whatever to do with the ignition system.

IGNITION—Conventional imported dual high tension.

LUBRICATION—Constant level circulating system, dash sight feed, grease and oil cups.

COOLING—Water, gear-driven centrifugal pump, cellular radiator, six blade flat-belt-driven fan, large integral water jackets.

CLUTCH—Multiple disc, cork inserts, running in oil.

TRANSMISSION—Selective sliding gears, three speeds forward, one reverse, direct on high, five imported annular bearings.

DRIVE—Propeller shaft, through two combination slip and universal joints, bevel gears, ball joint spring cushion torsion tube, bevel gear differential.

REAR AXLE—Internally ribbed center housing, semi-floating live axle; four imported annular, two imported thrust, two roller bearings.

FRONT AXLE—I-section drop forging, without welds, spring seats integral, Elliott type, four roller bearings in wheels, two imported ball bearings in knuckles.

FRAME—Pressed-steel, wide flanges, dropped frame reinforced by straight line steel secondary frame on which motor and transmission are mounted, strongly braced.

BRAKES—Four, all on rear wheels, 526 square inches surface, brake drum integral with wheel hub, internal metal shoes fiber lined, external fiber-lined bands.

SPRINGS—Front, semi-elliptic, 36 inches long; rear, three-quarters deep scroll elliptic, with shackled ends, lower half 50 inches, with shock absorbers in rear.

STEERING—Irreversible, worm and full gear.

WHEEL BASE—132 inches.

TREAD—56½ inches Standard (60 inches optional).

GASOLINE CAPACITY—21 gallons.

WEIGHT—3,400 pounds.

TIRES—36 x 4½; Goodrich (regular), Diamond or Firestone (optional).

WHEELS—36-inch front and rear, with Firestone Q. D. demountable rims.

BODIES—Vestibuled Touring, Clubman, Roadster, Limousine and Berlin, two to seven passenger. They are deep and wide in the driver's compartment and are designed to care for the comfort of large men. The tonneau is also exceptionally large, making a roomy car comfortably seating five.

The upholstering, which is of great depth and luxury, the divan cushions being eleven inches deep, is of high grade hand-buffed leather, and curled white hair.

SPEEDOMETER—Trip, grade, speed and odometer. Electric lighted.

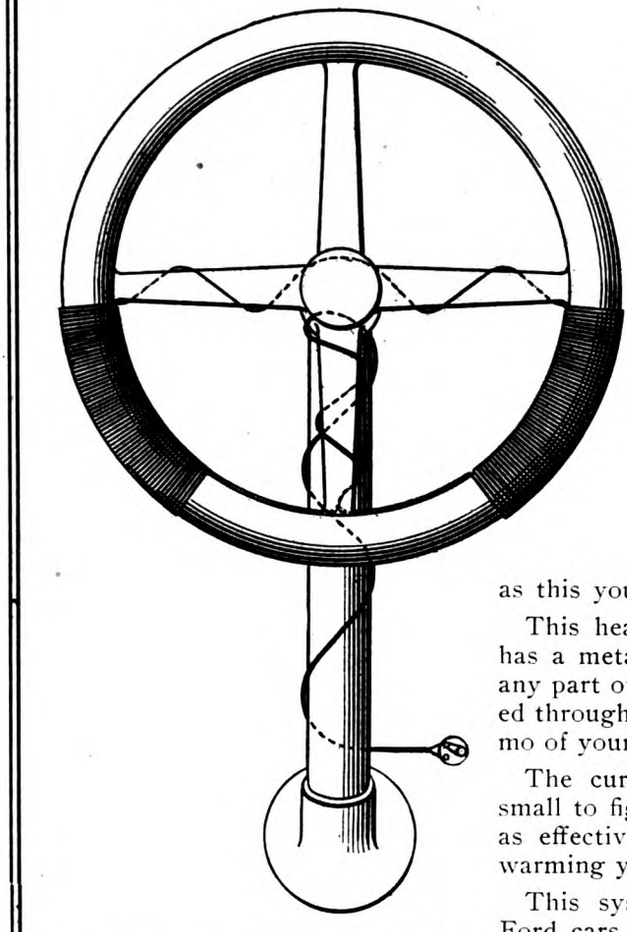
ADDITIONAL EQUIPMENT — Foot rail, robe rail, foot accelerator, muffler cut-out, shock absorbers on rear springs, one extra Firestone rim, tire irons, jack and tools.

ENCLOSED CARS—Interior furnishings complete, other equipment same as touring car.

PRICE—$2600 without top and windshield. F.O.B. Indianapolis.

Premier Price is from $2600 to $4000 for Touring Cars, Limousine, Berlin, Coupe, and De Luxe to $5000

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You can sell this electric Warm Hand Wheel on sight.

You do not need to be told that there is a demand for a device such as this—that will keep your hands as warm in winter as in summer and which may be put upon any car in twenty minutes' time without any alterations to the car.

It sounds almost too good to be true. But it is true, and if you're awake to the possibilities of getting the exclusive start with such a proposition as this you'll let us hear from you at once.

This heater is strong and enduring and has a metal exterior. It is wound around any part of the steering wheel and connected through a switch to the battery or dynamo of your car.

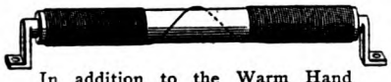
The current consumption is small—too small to figure at all, and yet the device is as effective as a stove or gas heater for warming your hands.

This system is especially adaptable to Ford cars, for the current supplied by the Ford inbuilt magneto is greatly in excess of what is needed for both the operation of the car and the heating of the steering wheel.

This heating device ready to install on the car retails for $10.00. In ordering state the make and model of the car.

A CORRECTION

In our announcement of the electric Warm Hand Wheel last week, through an error the retail price was designated as $7.50 This is wrong—the retail price of the electric Warm Hand Wheel is $10.00. The price of $7.50 applies only to the heater for the foot rail.



In addition to the Warm Hand Wheel we also manufacture a similar heater which may be attached to the foot rail in the tonneau. This foot rail attachment sells for $7.50.

The Warm Hand Steering Wheel Company

527 Fifth Avenue **NEW YORK**

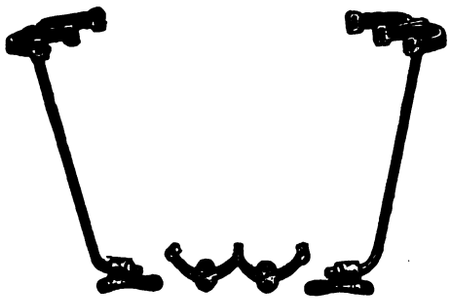
Patented April 23, 1907.
Patented Feb. 11, 1908.
Patented April 2, 1912.
} Other patents pending.

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The Largest Automobile Snpply House in America

FIFTEEN STORES IN THE UNITED STATES

"Torpedo" Tire and Demountable Rim Holders



Designed especially for use on Torpedo body or Fore-door cars. Set consists of two strong arms firmly bolted to running board and permitting of sufficient adjustment to accommodate two tires or demountable rims, of standard sizes, 4 inch or smaller. Made of solid Brass and guaranteed to give perfect satisfaction.

Finish: Furnished in Hard Rubber Black Enamel finish, and full Polished Brass.

	Brass	Black
Price, complete with Straps...	$4.00	$3.00

A dozen other styles and sizes in stock. See catalog.

Our 1912 Catalog, which is held as a book of reference by manufacturers, dealers and automobile owners, will be mailed on request. Circulation limited to 100,000 copies.

Chas. E. Miller

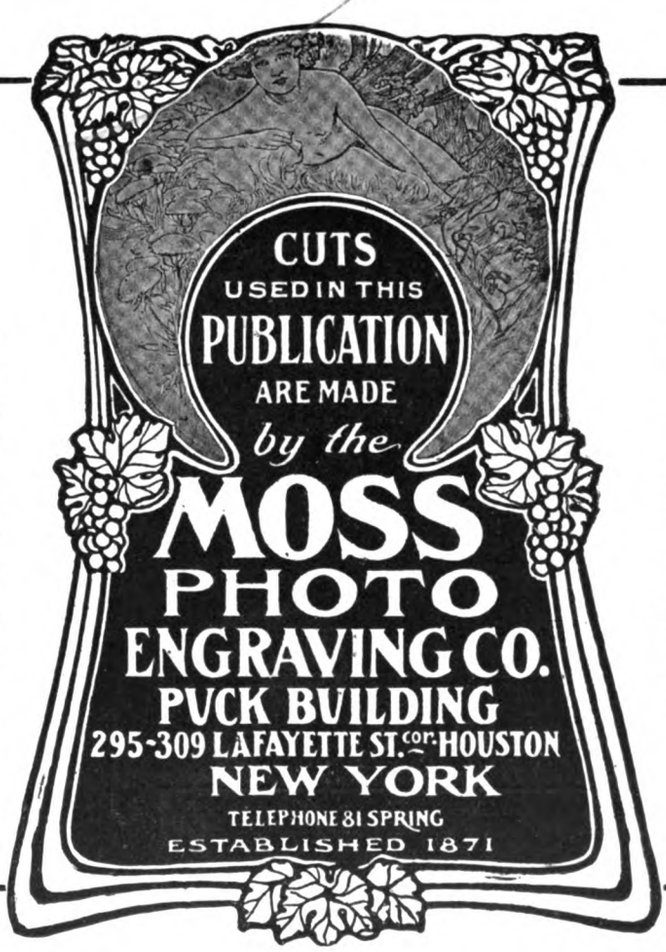
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HOME OFFICE

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is based on the fact that we have been handling the engraving of several prominent trade and general publications for years to the utmost satisfaction of both publishers and advertisers

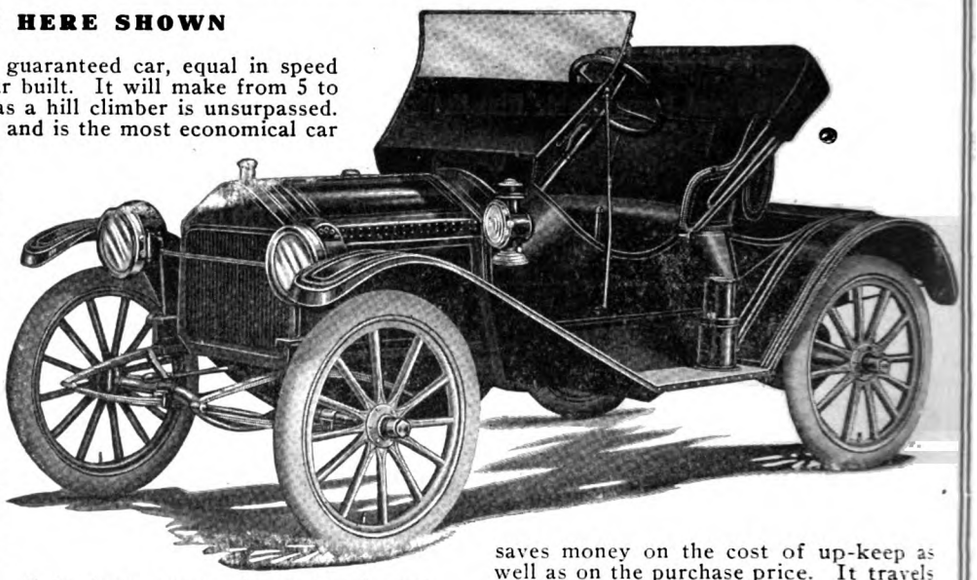
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The quality of work turned out by this plant is re-inforced by our facilities for deliveries as promised. Your work will be put through with the same care and dispatch given to publishers whose work must be right—and "right on the dot."

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METZ "22" THE MAXIMUM CAR AT THE MINIMUM COST $495.00

FULLY EQUIPPED, AS HERE SHOWN



THE METZ "22" Roadster is a fully guaranteed car, equal in speed and endurance to any other stock car built. It will make from 5 to 50 miles per hour on the high gear, and as a hill climber is unsurpassed. It is ideal both for business and pleasure, and is the most economical car to operate. Designed on exceedingly graceful lines and handsomely finished, the body being dark blue, with cream wheels. It is the car the American public has been waiting for, and is

A Big Money-Making Proposition for

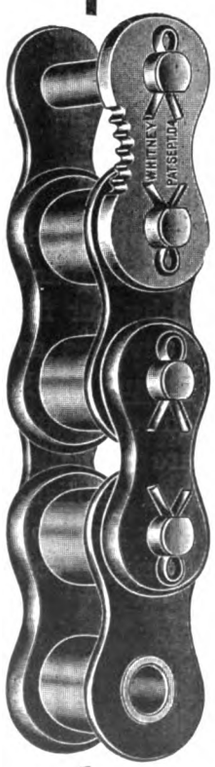
DEALERS

The METZ "22" is operated by center control, thus leaving BOTH sides of the car unobstructed for convenient entrance and exit. It is equipped with specially designed windshield, and perfect fitting side curtains.

Other features include: four-cylinder water cooled motor; Bosch magneto; full elliptic springs all around; best quality clincher tires; torpedo semi-enclosed body; extension top, with curtains entirely enclosing car when desired; dash lamps, gas lamps and gas generator, tail light, horn, pump, tire and tool outfit—a strictly high class Roadster, completely equipped for $495.00.

WRITE FOR ILLUSTRATED CATALOG and learn about all the remarkable features of the METZ "22." It saves money on the cost of up-keep as well as on the purchase price. It travels from 28 to 32 miles on 1 gallon of gasoline, 100 miles on a pint of lubricating oil, and from 10,000 to 12,000 miles on a single set of tires. It is the MAXIMUM car at the MINIMUM cost. Investigate the METZ "22." We want dealers in unoccupied territory.

METZ COMPANY, WALTHAM, MASS.

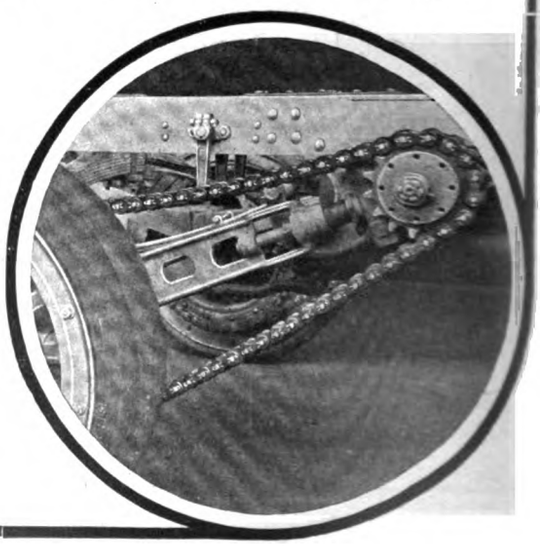


"Whitney" Chains

The Most Practical for Motor Trucks

Because the "Whitney" Cotter Detachable Chain can be easily separated at any link and lengthened, shortened, or repaired without the use of any special tool. This is of great advantage to truck builders, owners and drivers.

"Whitney" Chains are used by the leaders because they are strong, accurate, dependable and, above all, long lived. They are made right and they're made from the right kind of material, thus giving highest efficiency. When making replacements insist on a "Whitney" Detachable.



"Whitney" Chains Are Built for Strains

The Whitney Mfg. Company

HARTFORD, CONN.

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The Tires of "Extra Service"

Federal Tires are recognized everywhere as high grade tires that give extraordinary service. This is solely due to care and skill in the making.

The exceptional quality of Federal Tires has set a new *standard* for other makers of automobile tires—in order to equal the service of Federal Tires their quality must be matched.

FEDERAL TIRES

Quality Construction and *Road Service* go hand in hand. If an automobile tire lacks quality it cannot render better than average service—if it delivers *extra* service, quality construction is the answer. Federal Tires are "extra service" tires.

Made in all types for all standard rims

Federal Tires are supplied through leading dealers everywhere. An interesting tire book mailed to all who write.

Federal Rubber Manufacturing Co., Milwaukee

Branches and Agencies—*New York, Boston, Chicago, Kansas City, Minneapolis, Denver, Indianapolis, Columbus, St. Louis, Louisville, Omaha, Little Rock, Atlanta, Los Angeles, San Diego, Pasadena, New Orleans, Portland, (Federal Rubber Manufacturing Co. of Texas—Dallas, Houston, San Antonio).*

THINK THIS OVER very carefully and read it twice, if necessary.

Is there any part of an automobile engine, or any other gas engine, that is more important to its efficiency than a Valve?

Your engine leaves the factory running smoothly and sweetly—tuned up to its highest power. Perhaps the valves pit—warp - go out of shape—fail to hold compression. Then the power diminishes, and what can be more aggravating to the driver, who has known the fullness of the pulling power of his motor, than to have it grow less and less?

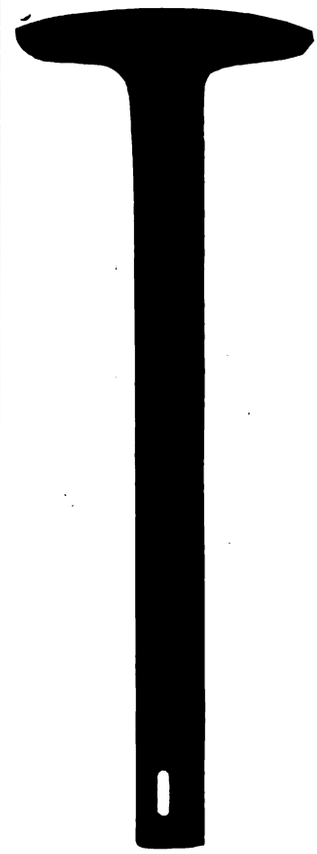
You cannot slight this part by putting in an inferior product—valves that will give trouble, or even break from inexperience in their manufacture—valves of unsuitable material, not suitably heat treated.

Too much is at stake, and a slight extra cost at the outset, which is the exception, may save you many times over a probable later expense.

This Company, with the experience of many years as a guarantee, will furnish you with properly made valves, of the materials best adapted to your requirements.

Not only QUALITY, but efficient SERVICE is a factor—surely there is a satisfaction in getting the kind of work you want—when you want it.

THE ELECTRIC WELDING PRODUCTS COMPANY
CLEVELAND, OHIO

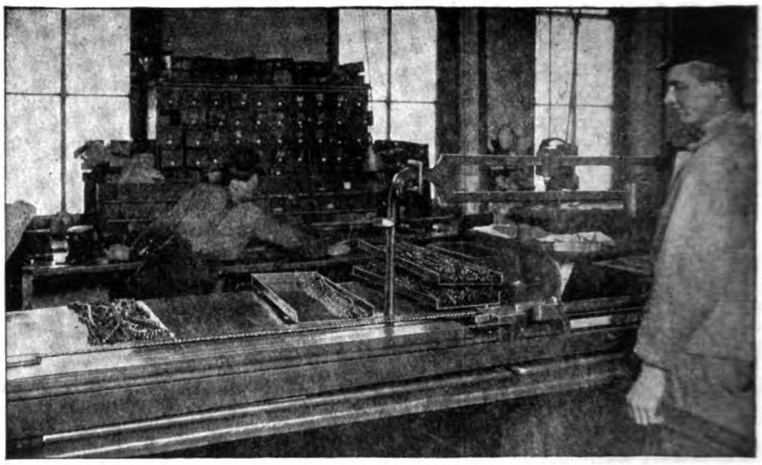


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Diamond Chains Must Be Good Our Tests Prove This



This picture shows a finished Diamond Chain receiving the final tensile tests to assure that the rivets and bushings are properly set, that the pitch is right at every link, that there are no material defects—in short that the chain is exactly what we claim—the best that modern methods can produce. This final test goes to just below the limit of fatigue of the metal, which is well above the economic working loads for which the chain is sold.



Individual parts of Diamond Chains receive many tests before being assembled and any parts which by micrometer gauging are found imperfect are destroyed. All holes in side links are reamed to exact size and pitch—not punched as is the usual practice. This reaming of holes insures an even and perfect bearing throughout entire thickness of side links, which is not possible with simply a punched hole.

The extra precaution which we take in the gauging of the millions of parts entering into our product is a large factor in our costs, but we prefer to assume this rather than put onto the market any chains of doubtful accuracy or uniformity.

High grade steels and our advanced methods of heat treatment are further factors that enable Diamond Chains to maintain their supremacy.

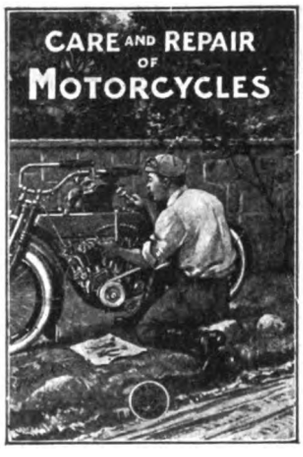
Let our engineers help you on your transmission problems. Send for our treatise "Power Chains and Sprockets." You will find it an interesting and valuable book of reference.

TRADE ◇ MARK

DIAMOND CHAIN & MFG. CO., 155 W. Georgia St., Indianapolis, Ind.

CAPACITY 8,000,000 FEET PER YEAR (133)

Care and Repair of Motorcycles



A TROUBLE SAVER FOR THE MOTORCYCLIST



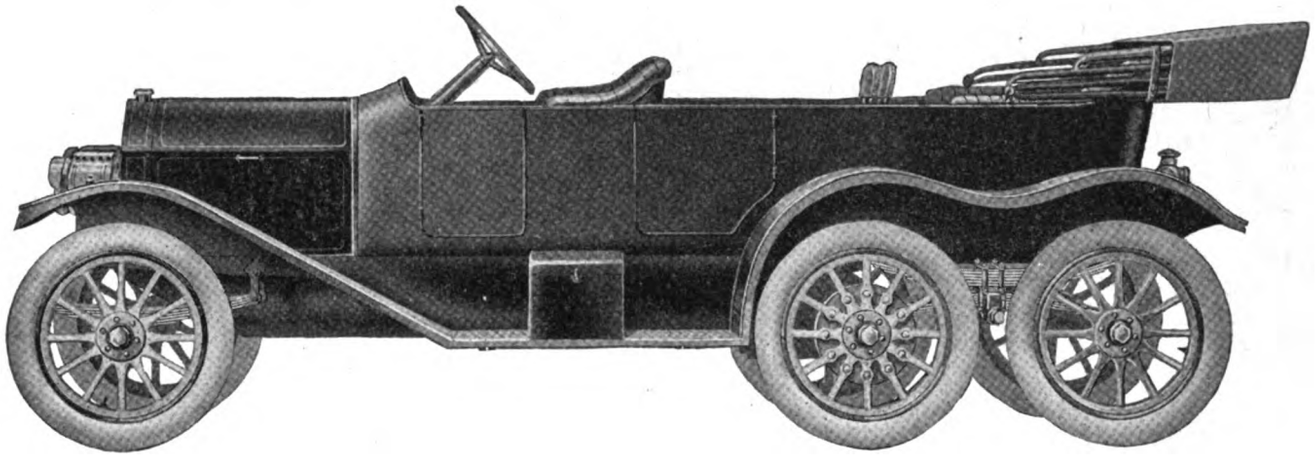
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Easiest Riding Car in the World

Built on the principle of a Pullman Palace car and rides like one.

A scientifically accepted and proven principle for easy riding at last perfectly applied to the automobile.

A luxuriously appointed car from every viewpoint. The only six wheeled car in the world.

Tire trouble and expense actually reduced. Guaranteed in every respect by a responsible company.

If interested, address:

REEVES SEXTO-AUTO COMPANY, Columbus, Indiana

In All the World No Car Like This

Ten successful seasons—the wonderful long stroke motor—added improvements and refinements give this wonderful car the greatest value ever offered for $1800. Read the list below of the most notable features of the

Dreadnought Moline M-40

10 inch more wheel base (now 124)
Electric Lights—Dynamo System
Five more Horse Power (now 40)
Improved Steering Gear
Gasoline Tank under Cowl—
Indicator and filler on dash
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Ten inch Upholstery
Flush Side Bodies
Nickel Trimmings
Long Stroke Motor 40-H. P.
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Prest-O Self Starter
Turkish Spring Cushions
Large Wheels and Tires
Exceptionally Roomy Body
Demountable Rims (set of five)
Double Independent Ignition System
Carburetor Dash Adjustment
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DEALERS—We have a square deal proposition for you. Unique in many ways. Well worth writing for.

OWNERS AND DEALERS—Write for the most interesting catalog ever written.

MOLINE AUTOMOBILE COMPANY
107 Keokuk Street EAST MOLINE, ILL.

Dreadnought Moline



All Tire Manufacturers will only guarantee their produce when filled with air at the recommended pressure.

GET A 1912

Twitchell

POSITIVE LOCK STOP

Air Gauge

With it you can get more mileage out of the Tires, because you can always keep them at right pressure.

The Twitchell Gauge is Tire Insurance for a dollar—Order one from your dealer or from us direct.

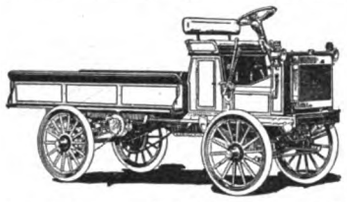
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No manufacturer has ever offered to dealers a more remarkable proposition than we offer

Chassis $1600



Stake or Express Body $1750

Here is a one-ton truck built by specialists in one-ton trucks—specialists with nine years' experience back of them. The motor is 4-cylinder, water cooled, unit power plant, 3-point suspension, with clutch and flywheel enclosed in oil type aluminum housing. Service brakes on rear wheel, emergency brakes on jack shaft drums. Splash and forced lubrication combined, with oil forced directly on all bearings inside the clutch.

Sanford trucks are remarkably accessible in every part, in every assembly, and in the entire assembly.

All we need is you, and if you listen to our proposition you will admit, yourself, that you need us. write.

The Sanford Motor Truck Co.
SYRACUSE, NEW YORK

BENZ

Since the introduction of BENZ cars to the motoring public of America no car has attained such world-wide supremacy as to its construction, standing up quality, and material. The new type of 35 and 50 H. P. BENZ models are the last word in automobile construction.

The noticeable features of this type of BENZ cars include the offset crank shaft, smokeless oiler, and SILENT CHAINS instead of timing gears.

The BENZ Carrosseries are noted for their beautiful lines and thorough comfort.

To those desiring AGENCY of this car the Benz Company will offer special terms. We want RELIABLE, ENERGETIC agents to further our interests for both BENZ pleasure cars and BENZ-GAGGENAU trucks, which today stand recognized by those who know, as the leading 6-ton truck. Wire or write us, no matter where you are.

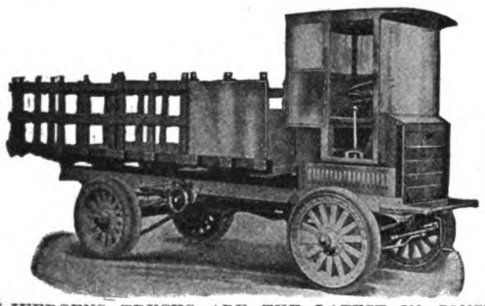
Our PRICES compete with LEADING AMERICAN makes.

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Lauth-Juergens

Lauth-Juergens Trucks are Delivery Insurance

QUALITY DURABILITY
ONE, TWO AND THREE TON CAPACITY



LAUTH-JUERGENS TRUCKS ARE THE LATEST IN CONSTRUCtion, most powerful in operation and the motors are guaranteed against defective workmanship and material for the life of the truck. They are positively the highest class trucks made. Two cylinder, one-ton, four cylinder, one, two and three-ton. Four speeds forward. Hess-Bright ball bearing transmission made in our own shops of the finest tool steel, three-piece disc clutch, covered by patents owned by us. Send for 1912 Catalog and specifications. Prompt delivery on all models. Large publicity campaign just begun. Our quality will do the rest.

Reliable Agents: Secure Your Territory for 1912 at Once.

The Lauth-Juergens Motor Car Co., Fremont, Ohio.

Branches and Agencies

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NEW YORK—West Side Garage & Motor Co., 160-162 101st St.
CHICAGO—The Lauth-Juergens Motor Car Co., 2630-32 Wabash Ave.
NEWARK, N. J.—Merchants Motor Car Co., Essex Building.
DETROIT, MICH.—Bierl Auto Truck Sales Agency, 453 Dix Ave.
DISTRICT OF COLUMBIA AND VICINITY—Bowles Motor Sales Co., Inc., 1608 14th St. N. W., Washington, D. C.

Remy Magneto

Exchange Your Old Magneto for a New Remy

IT will cost you practically no more than what you will be forced to pay out for constant repairs on your present ignition system. A new Remy will give your car new life. Here is our exchange proposition:

	List Price	Allowance	Net to You
2-Cylinder Remy Magneto with Coil, complete.....	$46 00	$ 9 20	$36 80
4-Cylinder Remy Magneto with Coil, complete.....	50 00	10 00	40 00
6-Cylinder Remy Magneto with Coil, complete.....	52 00	10 40	41 60

Allowance made for any make of Magneto.

Remy Electric Company
Anderson, Indiana

BRANCHES—New York, Boston, Detroit, Chicago, Kansas City, San Francisco, Indianapolis.

SERVICE STATIONS—Albuquerque, Augusta, Baltimore, Charlotte, Cincinnati, Cleveland, Denver, Dallas, El Paso, Houston, Jacksonville, Louisville, Memphis, Minneapolis, New Orleans, Nashville, Norfolk (Va.), Omaha, Los Angeles, Philadelphia, Pittsburgh, Portland (Me.), Portland (Ore.), Rochester, San Antonio, Seattle, Spokane, St. Louis, Syracuse, Utica, Washington (D. C.)

CANADA—Toronto, Winnipeg, Calgary, Hamilton, Vancouver, Montreal.

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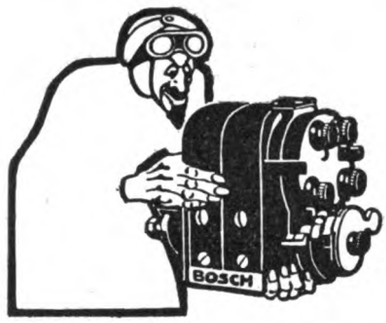
Schafer Ball Bearings

The "Schafer" ball bearings are the standard of the world. They have been for years at the pinnacle of merit, and remain there because of exceptional workmanship, and the care taken in every step of the manufacture.

The ball bearings are made of especially analyzed, extraordinarily dense crucible cast steel, that combines uniform hardness with toughness from center to surface. All balls show a wonderfully great crushing strength and any ball showing the slightest defect is promptly rejected.

In specifying Schafer Ball Bearings, the manufacturer of the car is assuring the ultimate buyer of one point of quality that goes to make a good automobile still better.

Barthel, Daly & Miller
42 Broadway, New York City



BOSCH

MAGNETO AND PLUGS

THERE is but one standard of ignition; the value of others is determined according to that standard.

By Bosch All Others Are Judged
Be Satisfied Specify Bosch

BOSCH MAGNETO COMPANY
223-225 West 46th Street, New York

Dependable Deliveries



DELIVERY dates are of utmost importance. Delay in shipments means loss of money.

We guarantee prompt deliveries.

Warner Quality and Warner eight-year old reputation for making highest class gears is back of the product.

Car makers interested in the Quality and Merit that means absolute safety and satisfaction will do well to write.

We modify our designs to meet detail requirements, or build to approved designs on seasons quantity specifications.

Philadelphia, Glenwood Av. and 2nd St.
Detroit, 628 Ford Building

Warner Gear Co.
Muncie - Indiana

Great Northern Hotel
CHICAGO

Ideal Headquarters for Automobilists

Rates:
Without Private Bath
$1.50 and $2.00
With Bath
$2.50 to $4.00



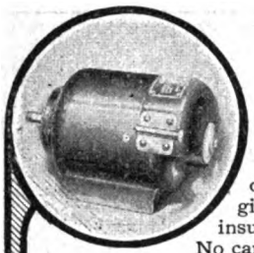
Large, Comfortable Rooms
Grill Room Popular Prices
Cafe on Parlor Floor

Service and Appointments Most Approved

Most centrally located hotel in Chicago and absolutely of fireproof construction.

Jackson Blvd., Dearborn and Quincy Sts.
JOHN C. ROTH, Managing Director

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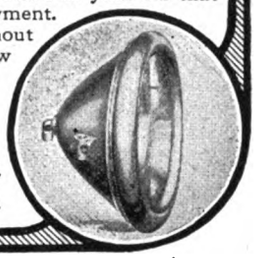


Aplco Electric Lighting System

The equipment that robs night driving of all its annoyances and dangers and gives you the confidence in your car that insures perfect enjoyment.

No car is complete without an Aplco System. Specify it on your new car or write us about our outfits to bring your old car up-to-date.

The first electrically lighted automobile was Aplco lighted. It has been recognized as the leading system ever since.



THE APPLE ELECTRIC COMPANY
13 N. Canal Street Dayton, Ohio, U. S. A.

Any Kind Every Kind Stock, or to Blue Print

Rims

Clincher Q. D. Demountable Channels

For Automobiles, Motor Trucks, Aeroplanes, Motorcycles, Bicycles.

We Also Make Axles and Hubs.

MOTT WHEEL WORKS, Utica, N. Y.
R. B. ABBOTT SALES CO., Sales Agents, Detroit

JONES HUB ODOMETER

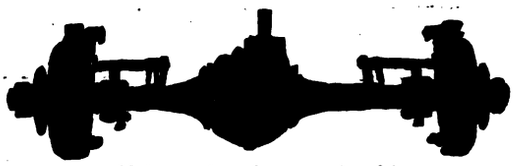
For use on pleasure cars, taxicabs or commercial vehicles where a complete record of mileage is desired.

The HUB ODOMETER is attached to hub. Concealed so that it can't be tampered with or disconnected without owner's knowledge. Mileage always visible and instantly ascertained. Withstands most severe usage.



THE JONES SPEEDOMETER
Broadway at 76th Street New York

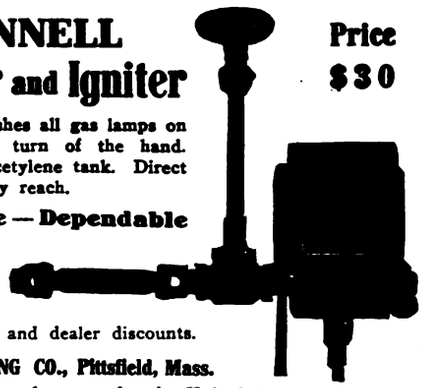
American AXLES



Write today for our booklet
THE AMERICAN BALL-BEARING COMPANY
Cleveland, Ohio

THE GRINNELL Gas Controller and Igniter

Price $30

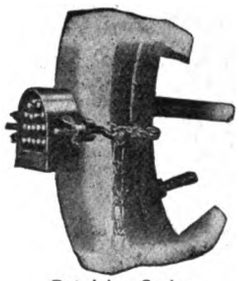


Lights, dims and extinguishes all gas lamps on the car through a simple turn of the hand. Coupled to valve-stem of acetylene tank. Direct control. Always within easy reach.

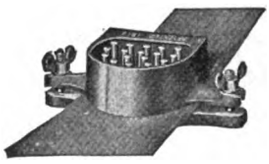
Convenient—Safe—Dependable

Every car owner in your vicinity, Mr. Dealer, will be interested—it's up to you to show them—and sell them. Write for booklet and dealer discounts.

THE G. C. A. MANUFACTURING CO., Pittsfield, Mass.
Sole Licensed Manufacturers for the United States



Repairing Casing



TIRE CUTS ruin casings. They admit moisture to the carcass, cause the fabric to rot and weaken, grow larger-end in blowouts.

You can repair **CASINGS** and **INNER TUBES** anywhere in 15 minutes, better than a Repair Shop can do—and for *one cent.*

Universal Auto-Vulcanizer
Patented

A practical vulcanizing outfit complete, with enough repair gum to make 40 patches. It weighs 3 pounds and can be carried in the tool box. **Simplest and most satisfactory device for eliminating tire troubles that has ever been devised.**

Absolutely automatic. Place the patch—attach the Vulcanizer—put in the gasoline—light it. No further attention required. In 15 minutes the job is done.

It *can't burn, scorch* or *injure* tube or casing. It *can't* get out of order. It *can't* fail to do its work. So simple, anyone can operate it. The Universal Auto-Vulcanizer saves its cost a *hundred times* over in trouble and expense

Price Complete, **$4.00** Ready for Instant Use
Guaranteed Satisfactory or Money Refunded
ADAMSON MFG. COMPANY, East Palestine, Ohio

AUTOMOBILE OWNERS AND TOURISTS

should break their journey and avail themselves of the excellent facilities afforded by the D. & C. Lake Lines, operating daily service between Detroit and Buffalo and Detroit and Cleveland.

Enjoy the delights of the cool breezes from Lake Erie and resume your journey in the morning after a refreshing night's rest. Special attention given by this Company to the handling of automobiles. Rates quoted on application (state wheel base); Tanks of Automobiles must be emptied of gasoline before being shipped; three gallons of gasoline supplied free on arrival at destination.

Roads in this section of the country are in first class condition; new road now under construction between Detroit and Toledo. Tourists speak highly of the route between Buffalo and New York.

On your trip this summer bear in mind "The Waterway is The Only Way."

DETROIT & CLEVELAND NAVIGATION CO.,
General Offices, Detroit.

Standard Universal Rims



fit any style or make of tires. The side rings are reversible, they curve outward on one side to fit a straight side tire, inward on the other to accommodate a clincher. Two turns of a nut unlocks the rim for demounting, two more turns locks the rim in place. Write for catalog 607, which explains fully.

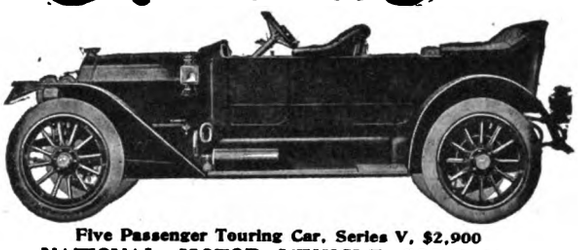


THE UNITED RIM COMPANY, Akron, Ohio

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Stock Champion International Champion

National 40



Five Passenger Touring Car, Series V, $2,900

NATIONAL MOTOR VEHICLE COMPANY

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"RAJAH" SPARK PLUGS

Ignition Absolutely Sure

RAJAH AUTO SUPPLY CO. BLOOMFIELD, N.J.

Also Makers of RAJAH TERMINALS- the Best Made

Hupmobile

Long-Stroke "32" Touring Car $900 F. O. B. Detroit

Motor 3¼ x 5½ inches; four cylinders; Bosch magneto; three speed sliding gears; tires 32 x 3½ inches; 106 inch wheelbase. Equipment includes windshield, gas headlights, generator, oil lamps, tools and tire repair kit.

Roadster body on same chassis and with same equipment, $900 F. O. B. Detroit.

20 H. P. Models

Runabout—$750

F. O. B. Detroit. Same power plant as World-Touring Car. Wheelbase, 86 inches. Equipment of top, windshield, gas lamps and generator, oil lamps, horn and tools.

Roadster—$850

F. O. B. Detroit. Same chassis and power plant as World-Touring Car. Wheelbase, 110 inches. Same equipment as Runabout, also highly finished steel box on rear deck for tools and accessories.

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HUPP MOTOR CAR CO., 1254 Milwaukee Ave., Detroit, Mich.

COVERT

TRANSMISSIONS Suggest COVERT—
COVERT Implies QUALITY!

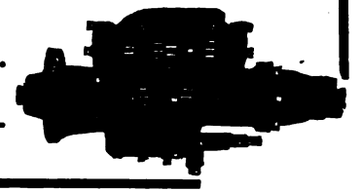
We make the best TRANSMISSIONS and at the least cost to the buyer.

We have the experience, equipment and determination.

The many who use them believe we do.

We believe we can convince you.

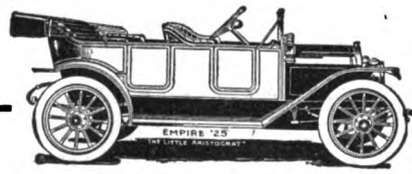
Will you let us try?



COVERT MOTOR VEHICLE CO.

Sales Office:
Ford Bldg., Detroit, Mich.

Factory: Lockport, N. Y.



Empire Twenty-Five

"The Little Aristocrat"

This is the Big Brother of the Famous Empire Roadster and is a small edition of $5,000 cars.

Hence the price of $850 puts this car in a class by itself. Specifications prove the Empire 25 to be the most "aristocratic" little touring car in America. Write for details today.

THE EMPIRE AUTOMOBILE CO., 224 Massachusetts St., Indianapolis, U. S. A.

Ford

THE UNIVERSAL CAR

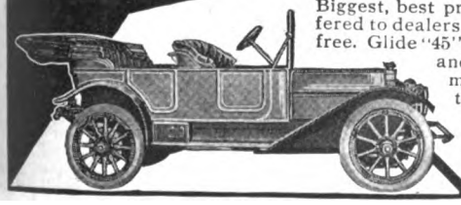
Its lightest—rightest—most economical—that's the reason we'll make seventy-five thousand of them this year. Prices $590 to $900. Agencies everywhere.

Ford Motor Company Detroit, Mich.

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Model "45"—$2150

Biggest, best proposition ever offered to dealers. Illustrated book free. Glide "45" in Two, Four, Five and Seven passenger models. Write us today.



The Bartholomew Company
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The Easiest Riding Car in the World

MARMON

Thoroughly expressive of the highest development of automobile design, materials and construction.

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THE NEW SERIES
Marmon "32"
$2850 to $4100
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NORDYKE & MARMON CO.
(Established 1851)
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Sixty Years of Successful Manufacturing

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THE LONG HORN

The One Mechanical, Never Failing Warning Device

Costs Little to Buy—Costs Nothing to Operate

No Battery—No Wire—No Bulb—No Motor to break down or fail to work.

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Champion Spark Plugs

Special Designs for Every Type of Motor Made

CATALOG MAILED ON REQUEST

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The Reasons for Jencick Quality and Jencick Prices are worth knowing.

JENCICK MOTORS For Motor Trucks

from base to spark plug, have features that are "Different and Better."

JENCICK MOTOR CORPORATION

Port Chester, New York



Patent "Luxury" Folding Seats

Do you wish to make your car more comfortable by installing a pair of auxiliary seats? If so, have the best. Our seats are made in five styles. Send for catalogue.

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"AC"

This name stands for efficiency in SPARK PLUGS

Used as standard equipment by eighty-one manufacturers.

CHAMPION IGNITION COMPANY, Flint, Mich.

Repair Parts For MORA Transmissions

We have in stock all parts for the transmissions of MORA automobiles. Write us for prices on any parts you may require and save money over having them made up special.

The NEW PROCESS N.P.R.H. RAW HIDE CO.

OFFICE & WORKS SYRACUSE, N.Y.



Ready for 1913

"STANDARD" WHEELS

FOR PLEASURE OR COMMERCIAL CARS

One Passenger to 16 Tons Capacity

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STANDARD WHEEL COMPANY, Terre Haute, Ind.



Eliminate Noise in Your Car

Use Hyatt Roller Bearings





Hyatt Roller Bearing Co.

Detroit, Michigan

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Better Than Commercially Perfect

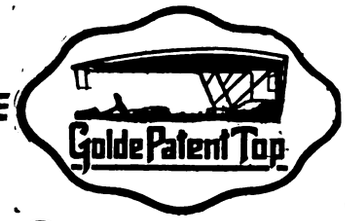
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Bevel Differential
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$3,000,000 in plants affording the most superior facilities for fine work; also hardening and treating of the finished product. Most thorough inspection and testing system. Our own laboratory.

Brown-Lipe-Chapin Gear **Company**

H. W. CHAPIN, Gen'l Mgr. SYRACUSE, N. Y.



THE ONE-MAN TOP

The only Auto Top which can be handled by one person as easily and quickly as an umbrella. No front supports in way of your arms when driving.

GOLDE-PATENT MANUPACTURING COMPANY,
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"Firestone" Tires and Rims

are the least likely to require changing, and afford the best means of tire changing when required.



The Firestone Tire & Rubber Co., Akron, Ohio
and All Principal Cities

NEWTONE Motor Horns

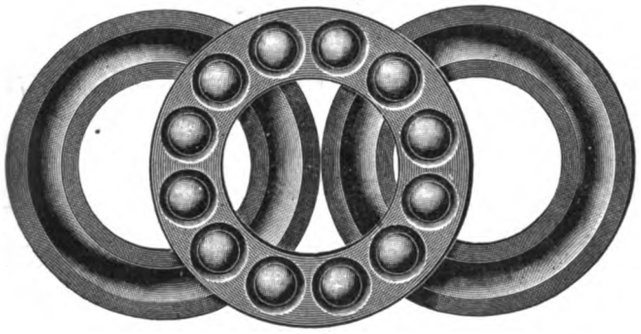
GUARANTEE—
We guarantee the "Newtone" Horn to give absolute satisfaction under all conditions and further, that operating expenses will be at least 50 per cent. less than any other horn of this class.



Torpedo Type
Price $20

Automobile Supply Mfg. Co.
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WE MAKE THE BEST



BANTAM ANTI-FRICTION CO., Bantam, Conn.

Diamond Tires

We could build them cheaper
But We Won't.
We would build them better
But We Can't.

THE DIAMOND RUBBER CO.
AKRON, OHIO

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Manufacturers of Auto Parts,
Kinwood Radiators, Fenders,
Kinwood Oilers, Gaskets,
Kinwood Steel Frames, Etc.

SPECIAL METAL STAMPINGS



TRADE MARK **Raybestos** REG. U.S. PAT. OFF.

THE BRAKE LINING THAT MADE THE AUTOMOBILE SAFE

Insist on having the original and best. Every foot of RAYBESTOS is stamped with our trade mark. It costs the car owner no more and our reputation is your guarantee.

THE ROYAL EQUIPMENT COMPANY
436 Housatonic Ave. Bridgeport, Conn.
We also make Duplex and Raymond Brakes and Gyrex, the Mixer.

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New Departure Guaranteed Ball Bearings

are in 60% of the 1912 cars. Contracts for 1912 cover 80% of the entire output of American automobile manufacturers next year. Reason—New Departure Ball Bearings have "made good." Have you had our 1912 catalog?

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Western Branch: 1016-17 Ford Building, Detroit

The Electric Car of Quality

THE COLONIAL

Big, roomy, 5-passenger, open or enclosed car of distinctive design and luxurious appointments. Equipped with self-starting device. It's the car with a thousand little conveniences—

and the price is $2700

DEALERS—Wire now for territory which is choice but going fast.

COLONIAL ELECTRIC CAR COMPANY

Detroit, Michigan

DURABLE MEANS DEPENDABLE

DAYTON DELIVERY

DAYTON TRUCKS are made in 2, 3 and 5 ton models. They hold a world's record for durability, reliability and efficiency. Write for catalog.

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The Motor Lamps with Distinctive Features

There are no other motor lamps on the market with the advantages of Solar Lamps. Solars are always exclusive in style and in quality. They are the strongest lamps as well as the most effective.

In no other lamps can you obtain the Solar Special Short Focus Lead Glass Lens Mirror Reflector—the patented system of double ray light projection which gives two distinct fields of light for town and country use—or the new and exclusive black finish with a metallic lustre which is unaffected by heat or moisture. All of these features are exclusively "Solar."

Do not equip your car or specify equipment to the maker until you have seen all of the Solar advantages. See Solars at any live dealer's or write for the catalog.

Solars are made in all styles for oil, electricity, gas and in combinations.

Solar Lamps

BADGER BRASS MANUFACTURING COMPANY

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Drop Hammer Forgings

cost very little more than castings. They are vastly superior and less expensive in the end.

WE ARE SPECIALISTS

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DROP HAMMER FORGINGS

from special analysis steel.

Send prints of parts you will need in

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QUALITY AND SERVICE GUARANTEED

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Motor Car Manufacturers Since

1893

HAYNES

1912

Occupying the newest and most modern automobile manufacturing plant in America.

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No Cranking! No Pumping!

START YOUR CAR FROM THE SEAT
ALWAYS READY AND POSITIVE

The AMERICAN STARTER is the Only Starter on the market that measures the amount of gas injected into the cylinders. You cannot "dope" the engine with the AMERICAN STARTER.

American Starter and Carburetor Mfg. Co.

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SOLD EVERYWHERE

SHAWMUT TIRE CO., Boston, Mass.

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The most interesting fact the shrewd dealer and the wise buyer alike will learn for 1913 is clearly evident in every

Halladay

With the NEW 32, 40 and 50 on your floor you will need to do little arguing to make your sales. Ready now. Request further particulars.

STREATOR MOTOR CAR CO., Streator, Ill.

Hook up with COLE

COLE

Series Eight comes in Three Chassis:

Cole Sixty six cylinder Touring Car, five passenger convertible to seven passenger, 132-inch wheel base, Delco electric lighting, starting and ignition. **$2485**

Cole Fifty four cylinder Touring Car, five passenger convertible to seven, 122-inch wheel base, Delco system. **$1985**

Cole Forty four cylinder Touring Car, five passenger, 116-inch wheel base, Delco system. **$1685**

WRITE TODAY for **Cole Blue Book** and dealer's proposition.

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Hook up with COLE

A prudent buyer in selecting an automobile of permanent utility seeks the security of an established guarantee.

4 and 6 Cylinder Motors
2, 4, 5 and 7 Passenger Cars

KLINE KAR

4 Speeds Forward
Self-Starting
Detachable Rims

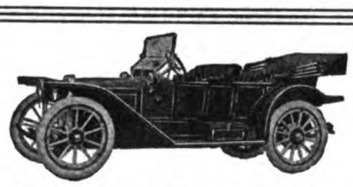
One Quality in All Models

4-30	$1700 $1750	4-40	$2200 $2250	6-50	$2800 $2850	6-60	$3300 $3500

Agents wanted in open territory. Write today.

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Factories: York, Pa., Richmond, Va.



AMERICAN
UNDERSLUNG

WE have published a very interesting book on the advantages of Underslung construction. It is of value to dealer or individual. It tells of our full line which ranges in price from $1475 to $4500. Write for a copy today.

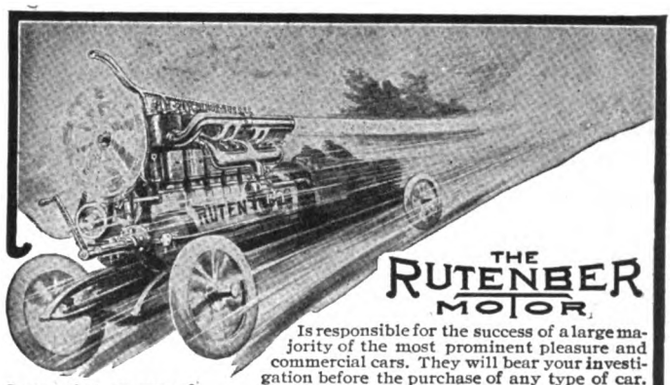
American Motors Company
Dept. E. Indianapolis, Ind.

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Climbs a 50% grade—Friction Transmission—any number of speeds. Five models—write.

CARTERCAR COMPANY, Pontiac, Michigan



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THE RUTENBER MOTOR

Is responsible for the success of a large majority of the most prominent pleasure and commercial cars. They will bear your investigation before the purchase of any type of car. Literature upon request.

RUTENBER MOTOR CO., Marion, Ind

The *Pioneer* Moderate Priced Six-Cylinder Car

HAVERS SIX — HAVERS MOTOR CAR CO.

Havers Self-Starting "Six-44"



Price $1850

SPECIFICATIONS TALK—Six-cylinder Motor, 4-cycle long-stroke type; 44 H. P.; Bosch Magneto; dual system; Model "C" Stromberg Carburetor. 122-inch wheel-base; 36x4-inch wheels; self starter. Springs, semi-elliptic front, platform suspension, rear; rear axle, full floating type.

Full specifications sent on request.

HAVERS MOTOR CAR CO., 2775 28th St., Port Huron, Mich.

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THE ULTIMATE CAR
(KNIGHT TYPE MOTOR)

The first American Car to adopt the Silent Knight Motor—the engine used by Daimler, Mercedes, Panhard and Minerva.

THE F. B. STEARNS CO.

CLEVELAND, OHIO

Branches and Dealers in 125 Cities

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4-36	4-44	6-66
$1,675	$2,150	$2,750

We are building 500 extra PULLMANS for 1913—1500 in all. Our present dealers have spoken for 1000 and the increase is for new territory—possibly yours is open. Our SALES MAKING ORGANIZATION helps the agent—let us tell you how.

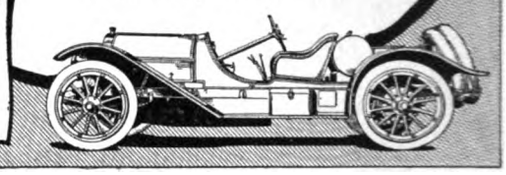
PULLMAN MOTOR CAR CO., York, Pa.

Speedwell

A Car with those Qualities that really count

THE SPEEDWELL MOTOR CAR CO.
DAYTON, OHIO.

Speed Car
2-Passenger
Equipped
with
Self-Starter



SPLITDORF MAGNETO

"Always There"

SPLITDORF ELECTRICAL CO.
98 Warren Street NEWARK, N. J.

BRANCHES

New York, Boston, Philadelphia, Chicago, Detroit, Kansas City, San Francisco, Los Angeles, Seattle, London, Buenos Ayres

R-C-H "Twenty-Five"

We are determined to build the best all-'round five-passenger touring car in the world and sell it, completely equipped, for

$900.00

F. O. B. Detroit

Write for Illustrated Circular.

R-C-H CORPORATION
104 Lycaste Street Detroit, Michigan

INTERLOCK INNER TIRES

Stop Tire Troubles

The one weak point of the automobile is that you cannot depend on the tires. Thousands of motorists have solved their tire problem by discarding inner shoes, reliners, fillers and other makeshifts and equipping their tires with **Interlock Inner Tires.**

Interlocks are complete inner tires (not inner shoes) placed between the outer casing and inner tube to strengthen the casing and protect the tube from punctures. They double the mileage of new tires and add 1,000 to 5,000 miles to old ones—save half your tire expense—and make tires trouble proof.

Dealers and Motorists—Investigate Interlocks

Don't delay—write now for booklets, data, prices, testimonials of users, road tests, etc. Mention size and kind of tires you use.

DOUBLE FABRIC TIRE CO. 600 W. 9th Street, Auburn, Indiana

K·D

The Motor With the Sliding Crescent Valve

KNIGHT-DAVIDSON
1896 — 1912

The CRESCENT valve of the K-D Motor, fitting around the stationary piston wall affords a larger port area than any other poppet or slide valve on the market. It is simpler and, consequently, better than any other valve construction known and is here offered to discriminating manufacturers, not as an experiment, but as a tried, tested and proved mechanical advance. The K-D motor is simple, silent, cools rapidly, has the simplest oiling system known, will not carbonize. Last and most important, will give on a given quantity of fuel more power, speed and endurance, unit for unit, than any other engine on any type of an automobile. We want to present some facts to interested manufacturers.

KNIGHT-DAVIDSON COMPANY, Boston, Mass.

KNIGHT-DAVIDSON

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"The Car With A Conscience"

Write for the advance announcement describing 1913 models.

FOUR AND SIX CYLINDER MODELS

$1000 to $3000

OAKLAND MOTOR CAR CO.
250 Oakland Boulevard PONTIAC, MICHIGAN

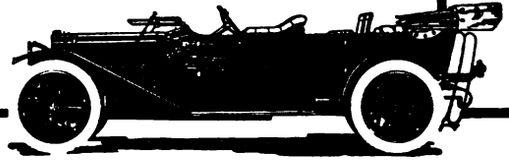
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Every part built in the KisselKar plant, which is equipped with every facility for economical manufacture. All KisselKars have extra liberal wheelbase and roomy tonneaus unsurpassed by any car at any price for comfort and capabilities. Write for catalog.

KISSEL MOTOR CAR COMPANY
159 Kissel Avenue Hartford, Wis.

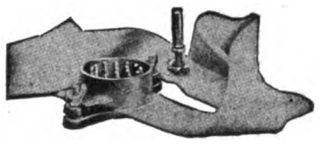
"Thirty"
"Forty"
"Fifty"
60 H.P. "Six"

KisselKar prices include full equipment—self-starter, top, windshield, demountable rims, speedometer, electric lighting equipment, shock absorbers, etc.



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Always Ready to Repair the Inner Tube



Patent Pending Nickel Plated

The simplest, easiest, surest way. A little rubber and one ounce of gasoline.

The Imperial Vulcanizer Repair Kit

Price $3.50

At your dealers, or sent by express.

Guaranteed to Satisfy

Address Dept. E.

THE McGRAW TIRE & RUBBER CO.
East Palestine, Ohio

Write or Wire

POLSON MANUFACTURING COMPANY
Buffalo, New York

for the very highest grades of brass goods that can be produced at prices that are right.

Folding Auxiliary Seats, Windshields, Bumpers, Wheel Pullers

and the one

Gasoline Engine Starter

that is

POSITIVELY SURE TO START
POSITIVELY SAFE TO START

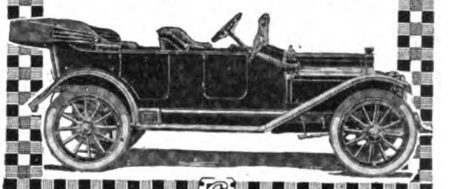
Cutting

1913 IMPORTANT FEATURES

Self Starter — Electric Lighting
Turkish Cushions — 36-in. x 4-in. Tires
12-in. Upholstering — Increased Wheel Base
GreatEase of Riding — Carburetor Dash Adjustment
Demountable Rims — Nickel Trimmings

Cutting B-40, 120-in. wheelbase, 40 h. p. 5-passenger touring car, fully equipped, $1475
Cutting A-40, 120-in. wheelbase, 40 h.p. 2-passenger roadster, fully equipped, $1475
Cutting C-55, 132-in. wheelbase, 55 h. p. 5-passenger touring car, fully equipped, $2000

CLARKE-CARTER AUTOMOBILE CO.
305 Mechanic Street Jackson, Michigan



"CONTINENTAL"



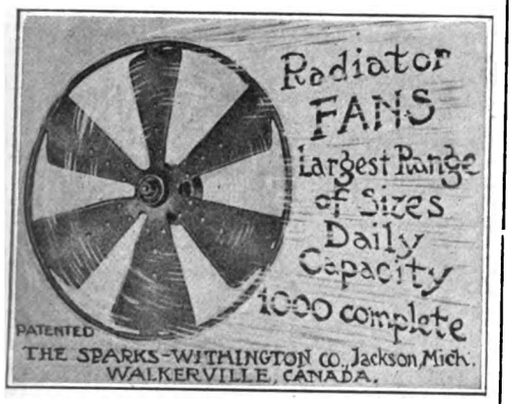
Continental Model "C"

Best known motor in America. Look for the name "Continental" on the crank case. We have looked after the quality behind it.

4 and 6 Cylinders
20 to 60 H. P.
Write for Booklets

CONTINENTAL MOTOR MFG. COMPANY
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FACTORY REPRESENTATIVES;
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Sheet Metal Stampings

Estimates Cheerfully Furnished

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GOODYEAR
AKRON, OHIO.

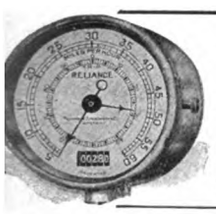
This name on Automobile Tires and Rubber Accessories signifies inherent qualities of material and workmanship that insure the maximum of service at the minimum of expense. (673)
The Goodyear Tire & Rubber Co., Akron, Ohio



Magneto Plugs coax maximum power out of engine.
EMIL GROSSMAN COMPANY, Mfr., New York and Detroit

Prest-O-Lite

The ONLY gas tank that when empty, can be immediately exchanged for a full one, ANYWHERE and ALWAYS.



RELIANCE
"The Speedometer of Quality"

Special features that eliminate speedometer troubles. Send for the booklet.

Reliance Speedometer Co.
134 Eliot St. Boston, Mass.

REPUBLIC
STAGGARD TREAD
The Tire Perfect!



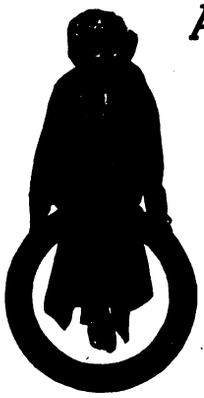
The NIAGARA Self Starter
Is "As Dependable as Niagara"
Simple as it Is Efficient
Good Territory Open
THE NIAGARA SALES COMPANY
704 Main Street Buffalo, N. Y.

LBA STORAGE BATTERIES
Class A for Electric Lighting
Class B for Electric Starting
Manufactured by
Willard Storage Battery Company
CLEVELAND, OHIO

ARE YOU in need of any additional help in any department of your business? Are you out of employment or looking for a better connection? Have you second-hand apparatus of any kind or do you want to buy second-hand material? Have you a factory site for sale or do you want to buy one? If so, use the Want and For Sale column of the Motor World. Seven words to the line, fifteen cents a line. Advertisements can be inserted over a number when it is desired and identity of the advertiser will be kept confidential.

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Kelly-Springfield Automobile Tires



You learn from experience what to look for in buying tires. We have learned from experience how to make the kind of tires your experience will tell you to buy.

KELLY-SPRINGFIELD TIRE CO.
20 Vesey Street, New York
Branch offices in New York, Chicago, Philadelphia, Boston, St. Louis, Detroit, Cincinnati, San Francisco, Los Angeles, Seattle, Buffalo, Cleveland, Baltimore, Washington, Atlanta, and Akron, Ohio.
Boss Rubber Co., Denver, Colo.
Appel & Burwell Rubber & Tire Co., Dallas, Texas.
Bering Tire & Rubber Co., Houston, Texas.
Todd Rubber Co., New Haven, Conn.

Weed Chains

The Great Anti-Skid DEVICE

Nine-tenths of all accidents to automobiles are caused by skidding or slipping.

Either you skid into the "other fellow" or the "other fellow" skids into you.

No matter how careful a driver you may be, you cannot prevent skidding or slipping on wet, muddy snow-covered roads or on icy, slippery greasy pavements unless you equip your car with Weed Chains.

Cannot Injure Tires
Because They Creep

An absolute necessity on both rear wheels and if you want to know what real steering steadiness means put them on the front wheels too.

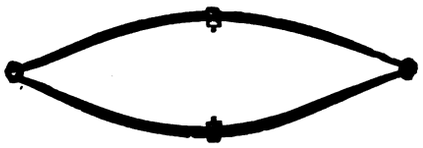
For your own safety—for the safety of the public, fully equip your car with Weed Chains. Make it your business to get a set today.

The Name "Weed" on Every Hook

Recommended and sold by all reputable dealers

Weed Chain Tire Grip Co.
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GUARANTEED AUTOMOBILE SPRINGS

Our plant is devoted exclusively to the manufacture of high quality springs. All work is oil tempered and warranted. Our circulars contain valuable information. Write.

PENN SPRING WORKS
BALDWINSVILLE, N. Y.

Standard Bearings
are
Enemies of Friction.
Why Don't You "Standardize"?
Standard Roller Bearing Company
PHILADELPHIA

INVADER OIL
"The Best the World Affords"
CHAS. F. KELLOM & CO.
Philadelphia Boston

STOP PAYING GARAGE RENT
Why Not Own Your Own Garage?

We are Manufacturers and Builders of Fireproof Steel Garages of all sizes. Write for Catalogue and prices.

THE FIREPROOF GARAGE COMPANY
1226 Ridge Avenue Philadelphia, Pa.

75% Increase in Tire Efficiency

That's what the INNERSHU accomplishes. It's a tough, durable, rubberized fabric formed permanently to tire shape. Ask for circular.

INNER SHOE TIRE COMPANY
Front Street Grand Rapids, Mich.

Auto-Top Fabrics
OF EVERY DESCRIPTION
SAMPLES AND PRICES ON REQUEST
L. J. MUTTY CO., Boston



Tones down headlights for city driving and foggy nights—an auto necessity. Price 75c. per pair. Sell like hot cakes. Dealers, secure the agency quick.

F. H. TOBIAS
1931 Broadway, New York

AJAX TIRES
Guaranteed 5000 Miles
Ajax-Grieb Rubber Company
General Offices: 1796 Broadway, New York City
Factories: Trenton, N. J. Branches Principal Cities

The National-Acme Mfg. Co.
Automatic Screw Machinery and Their Products.
CLEVELAND (Sixth City)
New York, 77 White St. Chicago, 23 So. Jefferson St.
Detroit, 1222 Majestic Bldg. Boston, 141 Milk St.
Atlanta, 3rd National Bank Bldg. Montreal

Aluminum Bodies
THE SPRINGFIELD TOP
(Pat. 1895)
SPRINGFIELD METAL BODY CO.
366 Birnie Avenue, Springfield, Mass.

Locomobile Cars for 1912
Complete information furnished on request.
The Locomobile Company
BRIDGEPORT, CONN.

THE MOTOR CAR EQUIPMENT CO.
The Only Exclusive Wholesale Automobile Supply House
Write for Our Complete Catalog and Revised Discount Sheet
55 Warren Street New York
Uptown Branch, 238-240 West 58th Street

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These Tires for You

Four corps of experts working in four of the best equipped tire plants in the world are operating as a unit to produce.

UNITED STATES TIRES

Nothing of the kind has ever before been attempted in automobile tire manufacturing.

United States Tire Company
New York

Nyberg

1913 ANNOUNCEMENT

THE TOURABOUT LINE

Four-40 Tourabout, 128″ wheel base, 34x4″ tires, $1450
Six-45 Tourabout, 136″ wheel base, 36x4″ tires, $1750
Six-60 Tourabout, 138″ wheel base, 36x4″ tires, $2000

THE NYBERG LINE

MODEL FOUR-37

Two Passenger Roadster.....$1285
Five Passenger Touring Car.....$1295

MODEL FOUR-40

Two Passenger Roadster.....$1400
Five Passenger Touring Car.....$1450
Four Passenger Tourabout.....$1450
Seven Passenger Touring Car.....$1550

MODEL SIX-45

Two Passenger Roadster.....$1700
Four Passenger Tourabout.....$1750
Five Passenger Touring Car.....$1750
Seven Passenger Touring Car.....$1850

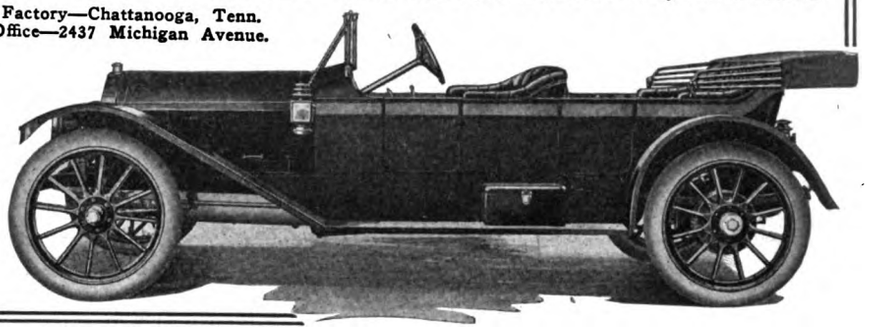
MODEL SIX-60

Two Passenger Roadster.....$2000
Four Passenger Tourabout.....$2000
Five Passenger Touring Car.....$2000
Seven Passenger Touring Car.....$2100

NYBERG AUTOMOBILE WORKS, Anderson, Indiana

Southern Factory—Chattanooga, Tenn.
Chicago Office—2437 Michigan Avenue.

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Perfection Spring Company

SPECIALISTS IN

Spring Suspension

High Grade Only

Cleveland, Ohio

Woodworth Treads

will help you to increase your business while benefiting your customers. We will send any responsible dealer a pair on 30 days' trial Write now. Good Agents wanted for unoccupied territory.
LEATHER TIRE GOODS CO., Niagara Falls, N. Y.



MOTZ Cushion Tires

For Pleasure Cars and Light Delivery Cars

Send for Booklet 58

THE MOTZ TIRE AND RUBBER CO.
Executive Office: Akron, Ohio

A—Shows double, notched treads.
B—Shows undercut sides.
C—Shows sidewise bridges.
D—Shows absorbing means when passing over an obstruction.

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1727 Broadway, New York 609 E. 18th St., Kansas City
1400 Race St., Philadelphia 2212 Euclid Ave., Cleveland
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Standard Tire & Rubber Co., 100-106 Portland St., Boston
Distributors for New England States

Mosler Spit Fire Plugs ARE THE BEST

A. R. MOSLER & CO.
P. O. BOX "M"
MT. VERNON, N. Y.

Reo the Fifth

Final and crowning achievement of R. E. Olds, pioneer designer of autos. A standard size 30 to 38 horsepower four cylinder car of modern refinements priced for the present at only $1,055.

(38) R. M. OWEN & CO., General Sales Agents
REO MOTOR CAR CO., Lansing, Mich.

The Bush Radiator

THE BUSH MANUFACTURING CO.
HARTFORD, CONN.



GRANT - LEES GEARS

The Grant-Lees Machine Co.
Cleveland, Ohio

"National" Steam Vulcanizers

GARAGE MODEL repairs three tubes and two casings at a time. Cheapest and best on the market. Get our special selling plan. Portable model for individual owners which will please your customers. List price, $12. Manufactured by

THE NATIONAL MOTOR SUPPLY CO.
1904 Euclid Ave. CLEVELAND, O.

The Ford Water Circulator

forces the water from radiator through cylinder water jacket, maintaining rapid circulation when car is in motion. Write for descriptive matter if you handle Ford cars.

THE FULTON-McCUTCHAN CO.
1146 Michigan Ave. CHICAGO, ILL.



Stop Fussing with Tires

Cut out the everlasting repairing!—the agony of punctures, blowouts, and delays Enjoy unrestricted pleasure—always, always—with DAYTON AIRLESS TIRES
Air-Free—Care-Free—cannot give out.
They save any motorist hundreds of dollars.
Send now for big FREE BOOK of money-saving, pleasure-making information you need now. You can't get it quick enough. Splendid dealers' proposition.
The Dayton Rubber Mfg. Co., 105 Kiser St., Dayton, O.

Absolutely Proof Against Every Trouble

Argo Electric

For the Gentleman and Gentlewoman

Beautifully Finished—Perfectly Equipped Easily Operated
Send for the new Argo Electric Catalog.
ARGO ELECTRIC VEHICLE CO., Factories, Saginaw, Mich.
Metzger-Herrington Co., Distributors,
2412-14 Michigan Ave., Chicago.

RHINELAND BALL BEARINGS

"INSURANCE FOR BUILDER AND USER"
RHINELAND MACHINE WORKS CO—— 142 WEST 42ND ST. NEW YORK

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For Sale—Wants—Exchange

15 cents per line of six words, cash with order: — In capitals, 25 cents per line —

A market place where Dealers, Jobbers and Manufacturers may buy, sell or trade used cars, parts and appliances and where help or situations may be secured at a nominal cost.

ATTACH A STANDARD GAS REFINER to your generator and have an illuminating system as bright, clean and reliable as electricity. Automatically removes moisture, lime and dirt from acetylene gas and brings it to its highest efficiency. Will give you a steady white light until every grain of carbide is exhausted. Can be attached to any generator on auto, motorcycle or motor boat in a few moments. Will pay for itself ten times over in the saving of carbide, burners, reflectors, tubing, etc. In polished brass, $1.50; nickle plated brass, $2.00. Guaranteed. BARNARD BRASS WORKS, 212 S. First St., Rockford, Ill.

I HAVE some great bargains in brand-new standard auto accessories, such as model "L" Schebler carburetors, 1 in., $11.50; 1¼ in., $12.75; 1½ in., $14.80, all other models 33 1/3% off; Stewart Speedometers. Model 26 list price $20, my price $14.25; Model 24 list $15, my price $11, any other model 30% off; Kloxenet horns $17; Red Head, Champion and Splitdorf plugs 65c. each; standard tires, any make, at dealers' prices, also some fine seconds. I can save you money; let me know your wants. H. S. SNYDER, North Ave., Dayton, Ohio.

PEERLESS AUTO TOP DRESSING
Waterproofs mohair and duck automobile tops and curtains. Makes faded and stained tops look like new. Leaves the cloth soft and pliable. Dries over night.
The Columbus Varnish Co., Columbus, O.

SEVENTY $2,000 cars handled the past season, but we need more capital. We have the best selling proposition in a western city of 10,000, with territory comprising seventeen counties. Throughout the country agencies for this car are acknowledged more desirable than any other in its class. Address Box 215, care The Motor World.

AUTO—Carter car, 5 pass., will sell cheap, cash, notes, or exchange, looks good, runs good. Box 163, Kennebunk, Me.

Are YOU in need of a Mechanical Engineer? Years experience in automobile accessories. At present with one of the foremost ignition manufacturers. Box 217, Motor World.

KENNEY NUT LOCK. Won't jar off. Holds tight wherever vibration exists. Patent and all rights for sale. Dr. W. F. KENNEY, 122 Hope St., Providence, R. I.

MITCHELL 30 H. P. ROADSTER—New tires, fully equipped, in excellent condition; cost $1,500; will sell for $400. J. B. G., 87 Elm St., Ludlow, Ky. Phone South 3473.

WILL GIVE MY PERSONAL MORTGAGE on improved real estate for a 1911 or 1912 Auto in good shape and worth prices asked; must be a reliable make. C. A. SACKETT, 21 Broad St., Milford, Conn.

WANTED—High powered automobile motor. Box 216, care Motor World.

WANTED—Town car or touring car body for model T Ford, fore door preferred, but any model considered, state price. A. J. SMITH, Plymouth, Mass.

LIST FORD OWNERS for U. S. and other makes of cars. Complete lists, 5,000 names, $2.50. OWNERS AUTO LIST COMPANY, Albany, N. Y.

PEERLESS BACK AND CUSHION DRESSING.
A renovator for leather seats and cushions. Brightens the finish, softens the leather and does not crack or peel. Dries in 20 minutes. The Columbus Varnish Co., Columbus, O.

STEAM Vulcanizing Plant—Complete, worth $200; only $25. 3528 N. 27th St., Omaha, Neb.

ONE 35 H.P. Parry Runabout, complete with top, $650. H. KASKEL, Spencerville, Ohio.

DRAUGHTSMEN WANTED—Prominent Cleveland automobile manufacturer needs competent draughtsmen to work in Engineering Department in laying out new models. Apply in writing. BOX 213, care of Motor World.

PEERLESS EXTRA FINE BLACK BAKING JAPAN.
Bakes to either a high gloss finish, eggshell gloss or dull finish, on lamps, radiators and fenders. Will not crack, chip or peel.
The Columbus Varnish Co., Columbus, O.

AGENTS WANTED — To handle the $1000 G. J. G. "Junior," racy, classy and specially designed chaseabout with 104-inch wheelbase, with a real 26 H.P. motor, Bosch magneto, Dorian remountable rims with 32 x 3½ tires, at a price of $1000, which is a money maker for the sales agent. Write for literature and discounts to G. J. G. MOTOR CAR COMPANY, White Plains, N. Y.

BROKEN CRANKSHAFTS, cylinders, crankcases, flywheels, gear teeth, pistons, perfectly welded and machined ready to replace. Guaranteed and references. Machinery up to 5 tons welded. ATLAS WELDING WORKS, 74-76-78 Irving St., Rahway, N. J.

MAILING LISTS—750,000 auto owners. S. H. CARROLL, JR., Albany, N. Y.

An ad. like this will cost you 75c. for each insertion.

Mr. Dealer:

You will surely find some where among these announcements a buying opportunity—

A straight line to something you want now—

Look them over and see—

* The circulation of The Motor World is a guaranteed one, sworn to by an affidavit, which will be sent in detail to any one upon request.

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For Sale—Wants—Exchange

15 cents per line of six words, cash with order. In capitals, 25 cents per line.

A market place where Dealers, Jobbers and Manufacturers may buy, sell or trade used cars, parts and appliances and where help or situations may be secured at a nominal cost.

AUTOMOBILES—A. C. C. A. Prices Talk! Every make. Every model. Hundreds runabouts, racy roadsters, five-seven passenger touring cars. $50 up. Guaranteed five years. Shipped Freight Prepaid! Write today for the largest Illustrated Catalog published! THE AUTOMOBILE AND CYCLE COMPANY OF AMERICA, Dept. I-N, 1769-1787 Broadway, New York City.

PEERLESS LINING DYE.
Makes a new lining out of a dirty, faded and stained inside. Will not fade or wash off. Leaves the cloth soft and pliable.
The Columbus Varnish Co., Columbus, O.

AUTOMOBILE AGENTS—I want local agents in every county in the United States to handle a popular-priced line of automobiles; a good name and reputation for integrity counts more with us than money or experience; if you have $300 and can furnish bond you can procure the agency for our high-grade car and we will furnish you with demonstrator. For full particulars address R. C. LEWIS, Sales Manager, Box 55, Milwaukee, Wis.

FOR SALE—Locomobile, 1911 model; horsepower, 30.6; maker, Locomobile Co. In good order. Not been used this year. Cost $5,000.00. Highest offer gets it. In perfect running order. Address M. W. ADAMS, Chatham, N. J., where car can be seen.

TO RESPONSIBLE parties only—Packard 18 touring car or limousine, will rent monthly or winter season with driver; reasonable. For full particulars write only to S. S. ZULA, 322 Columbus Ave., New York.

PEERLESS EXTRA FINE BLACK JAPAN.
Enamels lamps, radiators and fenders to a fine gloss finish. Will not crack, chip or peel. Not affected by heat, retains its lustre.
The Columbus Varnish Co., Columbus, O.

AUTOMOBILE Cylinders Reground, new pistons and rings fitted. Garage air compressors. CAST IRON BRAZING CO., Manchester, N. H.

FORD OWNERS—GET OUR CATALOG. AUTO PARTS CO., PROVIDENCE, R. I.

SALESMEN, one who is now visiting automobile trade or owners. Good money made on a very attractive proposition. STURDY MFG. CO., 2637 Michigan Ave., Chicago, Ill.

THE STEVENS-DURYEA COMPANY HAS ERECTED AND EQUIPPED A MODERN AND UP-TO-DATE FACTORY FOR MANUFACTURING THEIR OWN BODIES AND IS NOW READY TO RECEIVE APPLICATIONS FROM FIRST-CLASS WORKMEN IN THE SEVERAL BRANCHES OF BODY BUILDING: BODY MAKERS, SHEET METAL WORKERS, PAINTERS, UPHOLSTERERS, ASSEMBLERS, ETC. ADDRESS: SUPERINTENDENT, STEVENS-DURYEA COMPANY, EAST SPRINGFIELD WORKS, SPRINGFIELD, MASS.

ENAMEL YOUR LAMPS BLACK.
EXTRA FINE BLACK JAPAN.
The most elastic Enamel made. Dries in 10 to 12 hours. One or two coats may be used. Does not crack, chip or peel. Use on Lamps, Horns, Radiators, Fenders, etc. Air-drying. We also make the fine Baking Japan. Have your Garage or Supply Dealer order.
THE COLUMBUS VARNISH CO.,
Columbus, Ohio.

FOR SALE—Dealer in new and second-hand automobiles; Ford runabout, 4 cyl., 26 H.P., top, windshield, rumble seat. Maxwell runabout. Oldsmobile, 4 cyl., top, 5-passenger, and windshield. Rambler, 2 cyl., top, 5-passenger, and delivery body, all in good condition. F. B. ARDRIE, 21 Carnes St., W. Lynn, Mass. P. S.—Wanted—to buy 50 automobiles.

FOR SALE—Two brand new Rider-Lewis touring cars, 1911 model, fully equipped, have never been run. Will sell at a sacrifice if sold at once. M. E. LE SOURD AUTO AGENCY, Bellefontaine, Ohio.

PEERLESS LEATHER TOP DRESSING
Makes leather, rubber and pantasote tops and curtains look like new. A safe, durable renovator that leaves the cloth soft and pliable.
The Columbus Varnish Co., Columbus, O.

WANTED—First class electric automobile machinist and repairmen in Denver, Colo. P. O. BOX 1023.

AUTOMOBILISTS — Buy guaranteed tools and inner tube puncture-repairing material. Do your own repairing easily and quickly. Agent's price, $5.00; ours, $3.50, cash with order. Bank references. W. H. MIZELLE, Robersonville, N. C.

MOHAIR—DUCK—CANVAS—TOPS
Made to Look Like New.
PEERLESS AUTO TOP DRESSING
makes faded and stained tops a uniform black color, putting back the life that is worn out by the rain, sun and use. Leaking tops are waterproofed with one coat. Leaves the cloth soft and pliable. Anyone can apply it. Prices, 1 gal. $3.75; ½ gal. $1.90; ¼ gal. $1.00. Express collect. Have your dealer order.
THE COLUMBUS VARNISH CO.,
Columbus, Ohio.

Then remember that *8,000 other readers are doing the same thing—

5,000 of them dealers—

All of them intensely interested in the automobile industry. This means a live selling opportunity that costs mighty little.

An ad. like this will cost you 45c. for each insertion.

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EXPERIENCE — SHELDON — RIGHT DESIGN
FACILITIES — AXLES — RIGHT STEEL

"Made in the Largest Axle Factory in the World"

Axle Talk—No. XVIII

We are specialists on truck axle design, being particularly qualified to figure on cars that must qualify for hard service.

This department of our business can produce better axles than can be had elsewhere, owing to our knowledge of commercial car problems and our equipment for working them out.

Specialization—and by that we mean meeting the requirements of our trade—has been a factor largely responsible for the up-building of a department in this business that supplies seventy-five per cent of the axles on America's truck output.

To the car designer, this specialized knowledge is of more than ordinary value, because the proper designing of the axle for a particular car is quite as important as the selection of springs, bearings and other major parts in which alignment, weight, support and other important problems must be figured out and acted upon.

The automobile engineer who demands this co-operation service as co-equal with right material and expert workmanship, will find the combination right here in this, the birth place of quality axles at right prices.

SHELDON AXLE COMPANY, Wilkes-Barre, Pa.

CHICAGO OFFICE—68 East 12th St. DETROIT OFFICE—1215 Woodward Ave.

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KLAXON

WHY THE FIAT CARRIES THE KLAXON AS REGULAR EQUIPMENT

SHOWROOMS
FIAT AUTOMOBILE CO.
BROADWAY AND 57TH ST. NEW YORK
325 N BROAD ST PHILADELPHIA
839 BOYLSTON ST BOSTON
2239 MICHIGAN AVE CHICAGO

F·I·A·T

FABBRICA ITALIANA AUTOMOBILI TORINO

GENERAL SALES DEPARTMENT
POUGHKEEPSIE, N.Y.

POUGHKEEPSIE, N.Y. July 30, 1912.

Lovell-McConnell Mfg. Co.,
Newark, N. J.

Gentlemen:

Our reasons for selecting the Klaxon as regular equipment to the exclusion of all other makes are briefly as follows:

1. Every mechanical detail is found developed to proper point of finish.
2. The current consumption is low.
3. The tone penetrates distinctly over a greater distance.
4. Careful attention has been given to minor details even though they do not actually effect satisfactory operation of horn.
5. Your reputation behind the product.

The above assure F.I.A.T. buyers maximum satisfaction and liberal service should any unforeseen troubles ever arise.

Now that negotiations have been consummated you might be interested to know that in selecting on these points we disregarded price which in all the other instruments was from one half to two thirds less than the Klaxon quotation.

In conclusion, we are confident that we have only decided on a horn that is strictly in keeping with the high standard of quality and maximum efficiency it is our unfaltering aim to maintain.

Very truly yours

F.I.A.T.

Per _____ Asst. Mgr.

SGC/CAM

26 different motor cars are now regularly equipped with Klaxons



KLAXONET

Lovell-McConnell Mfg Company Newark, N.J., U.S.A.

KLAXON

"The Public Safety Signal"



KLAXON

KLAXONET

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Studebaker

The Dealer is Interested in Knowing About the Men Who Make the Car

You know that your success as a dealer depends first on YOU. Your energy, your skill, your integrity are your first big asset.

When it comes to selling a car you want to know, and you have a right to know, who are the men who make it?

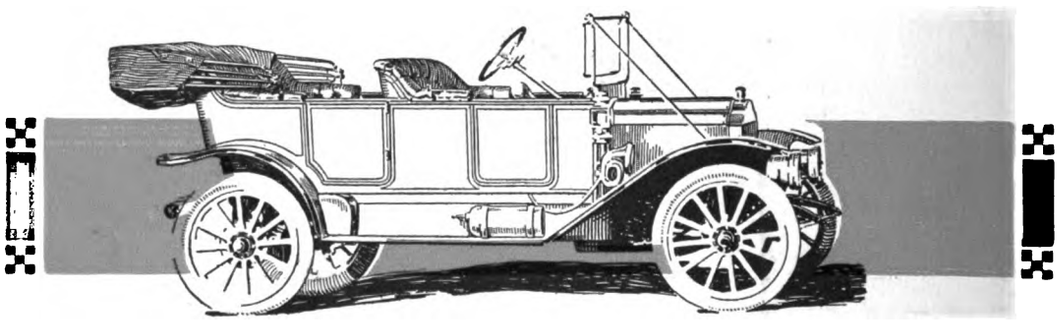
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Touring Car	$800	Touring Car	$1100
Roadster	750	Detachable Demi-Tonneau	1100
Utility Car	800	Roadster	1100
Delivery Car	800		

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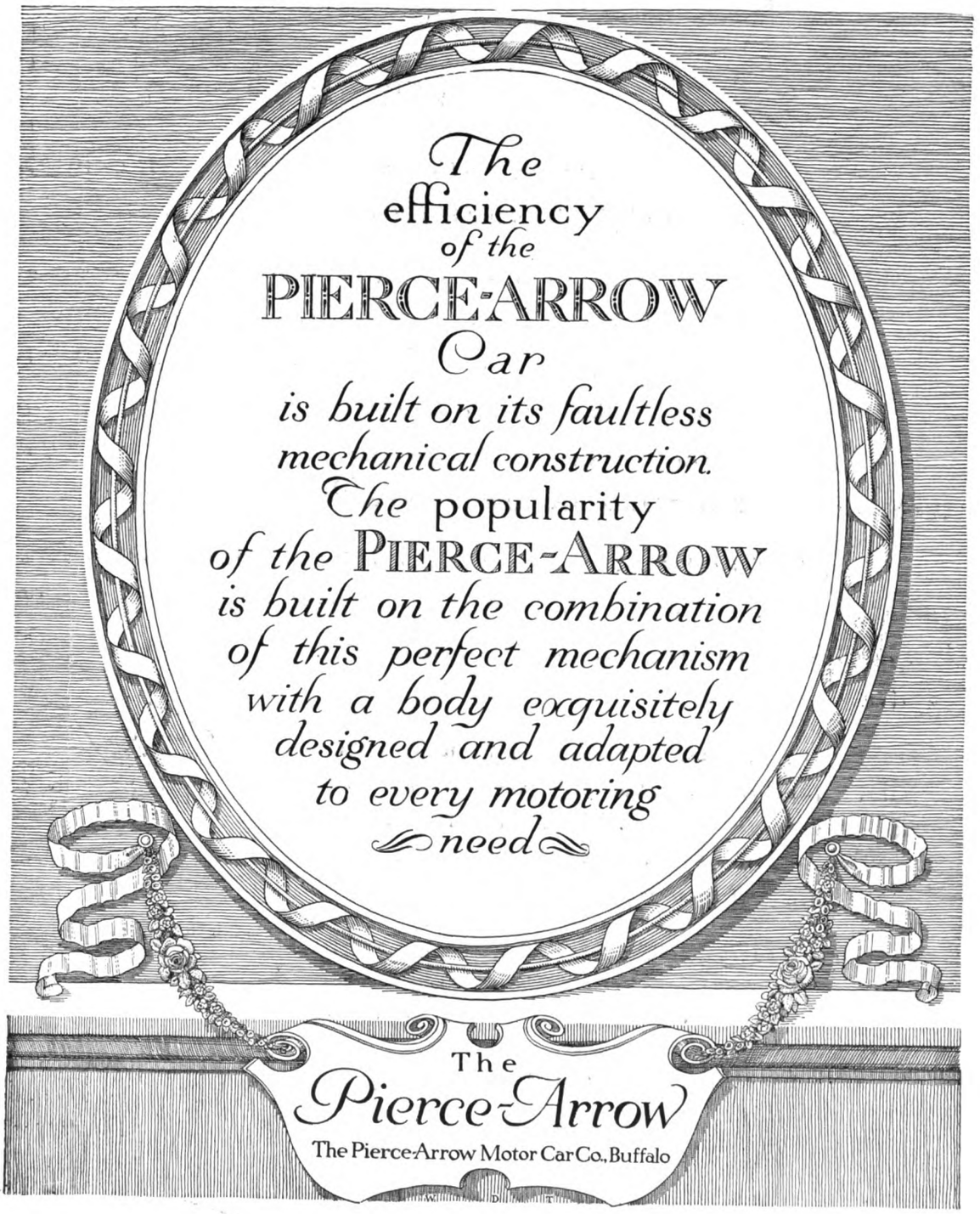
THE MOTOR WORLD

A Trade Paper Giving the World's Motor News

Vol. XXXII
No. 12

New York, September 12, 1912

Ten cents a copy
Two dollars a year



Published Weekly by The Motor World Publishing Company, 1600 Broadway, New York

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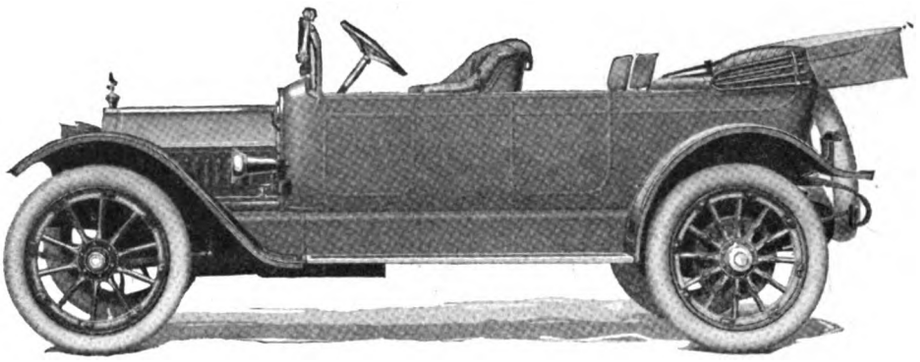


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BUFFALO, NEW YORK

ADVERTISERS INDEX

A

Abbott Motor Car Co..... 75
Adamson Mfg. Co..... 68
Ajax-Grieb Rubber Co..... 64
American Ball Bearing Co..... 60
American Motors Co..... 52
American Starter & Carburetor Mfg. Co. 72
Argo Electric Vehicle Co..... 64
Atwater Kent Mfg. Works..... 47
Automobile Supply Mfg. Co.... 41

B

Badger Brass Mfg. Co..... 72
Bantam Anti-Friction Co..... 71
Barthel, Daly & Miller..... 67
Bartholomew Co. 61
Benz Auto Import Co..... 66
Bosch Magneto Co..... 67
Bossert Co..... 75
Bretz Co., J. S..... 69
Briggs-Detroiter Co. 74
Brown-Lipe-Chapin Gear Co... 71
Bush Mfg. Co..... 77

C

Cartercar Co. 73
Champion Ignition Co..... 69
Champion Spark Plug Co..... 42
Clarke-Carter Automobile Co... 75
Classified Advertising 78-79
Cole Motor Car Co..... 73
Colonial Electric Car Co..... 72
Consolidated Mfg. Co..... 72
Continental Motor Mfg. Co.... 76
Corbin Screw Corporation..... 3
Covert Motor Vehicle Co..... 68

D

Dayton Auto Truck Co..... 72
Dayton Rubber Mfg. Co..... 77
Dean Electric Co..... 44
Detroit & Cleveland Navigation Co. 68
Diamond Rubber Co..... 71
Dorris Motor Car Co..... 70
Double-Fabric Tire Co..... 64

E

Electric Welding Products Co. 68
Empire Automobile Co..... 74

F

Fedders Mfg. Works..... 2
F. I. A. T..... 77
Fireproof Garage Co..... 76
Firestone Tire & Rubber Co... 71
Ford Motor Car Co..... 66
Fowler Waste Mfg. Co..... 76
Franklin Automobile Co..... 69
Fulton-McCutchan Co. 77

G

G. C. A. Mfg. Co..... 68
Gilmer, Jr., G. Walker..... 40
Goodyear Tire & Rubber Co... 77
Grant-Lees Machine Co..... 75
Great Northern Hotel..... 67
Grossman Co., Emil..... 77

H

Hartford Suspension Co., Inside front cover
Havers Motor Car Co..... 73
Hayes Mfg. Co..... 56
Haynes Automobile Co..... 72
Hodge & Graves Co..... 70
Hupp Motor Car Co..... 73
Hyatt Roller Bearing Co..... 49

I

Ideal Motor Car Co..... 70
Inner Shoe Tire Co..... 76
Inter-State Automobile Co..... 74

J

Jackson Automobile Co..... 73
Jeffery-Dewitt Co. 69
Jencick Motor Corp..... 54
Jones & Co., Phineas..... 68
Jones Recorder 69

K

Kellom Co., Chas. F..... 76
Kelly-Springfield Tire Co..... 65
Kinsey Mfg. Co..... 71



Digitized by Google

ADVERTISERS INDEX

Kissel Motor Car Co..... 74
Kline Motor Car Corp..... 73
Knight-Davidson Co. 74
Knox Automobile Co.....58-59

L

Lauth-Juergens Motor Car Co. 67
Leather Tire Goods Co..... 77
Locomobile Co. 76
Lovell-McConnell Co.,
Inside back cover

M

M & P Electric Vehicle Co.... 74
Marion Motor Car Co..... 66
McCue Co. 53
McGraw Tire & Rubber Co.... 76
Metz Co. 75
Michigan Motor Car Co..... 70
Michigan Crank Shaft Co..... 76
Miller, Chas. E..... 43
Minerva Hardware Mfg. Co.... 76
Modern Auto Appliance Co.... 77
Mosler & Co., A. R..... 75
Moss Photo Engraving Co..... 61
Motor Car Equipment Co..... 77
Mott Wheel Works..... 68
Motz Tire & Rubber Co..... 77
Mutty Co., L. J..... 76

N

National-Acme Mfg. Co..... 63
National Mfg. Co..... 46
National Motor Vehicle Co.... 73
New Departure Mfg. Co..... 72
Niagara Sales Co..... 70
Nordyke & Marmon Co..... 74
Nyberg Automobile Works.... 69

O

Otho Motor Co..... 77
Owen & Co., R. M..... 77

P

Parish & Bingham Co..... 71
Penn Springs Works..... 75
Perfection Spring Co..... 75
Piel Co., J..... 69
Pierce-Arrow Motor Car Co.,
Front cover
Polson Mfg. Co..... 71
Prest-O-Lite Co. 77
Pullman Motor Car Co..... 48

R

R. C. H. Corporation..... 45
Regal Motor Car Co..... 50
Reliance Speedometer 75
Remy Electric Co..... 66
Republic Rubber Co..... 71
Rhineland Machine Works..... 39
Royal Equipment Co..... 62
Rutenber Motor Co..... 73

S

Schrader's Sons, A., Inc..... 62
Shawmut Tire Co..... 72
Sheldon Axle Co..... 80
Smith Co., A. O..... 69
Sparks-Withington Co. 63
Speedwell Motor Car Co..... 74
Splitdorf Electrical Co..... 70
Springfield Metal Body Co.....76
Standard Roller Bearing Co... 76
Standard Welding Co..... 55
Stearns Co., F. B..... 1
Stewart Motor Corporation.... 37
Streator Motor Car Co..... 51
Studebaker Corporation. Back cover

T

Timken-Detroit Axle Co..... 57
Tobias, F. H..... 76
Twitchell Gauge Co..... 65

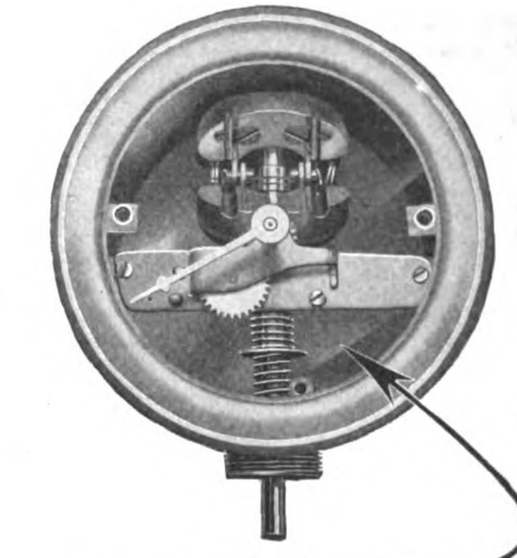
U

United Rim Co..... 68
United States Tire Co..... 77

W

Warm Hand Steering Wheel Co. 38
Warner Gear Co..... 64
Warner Instrument Co..... 65
Weed Chain Tire Grip Co..... 76
Willard Storage Battery Co.... 77
Willys-Overland Co. 4
Wisconsin Motor Mfg. Co.... 70
Woodstock Hotel 61

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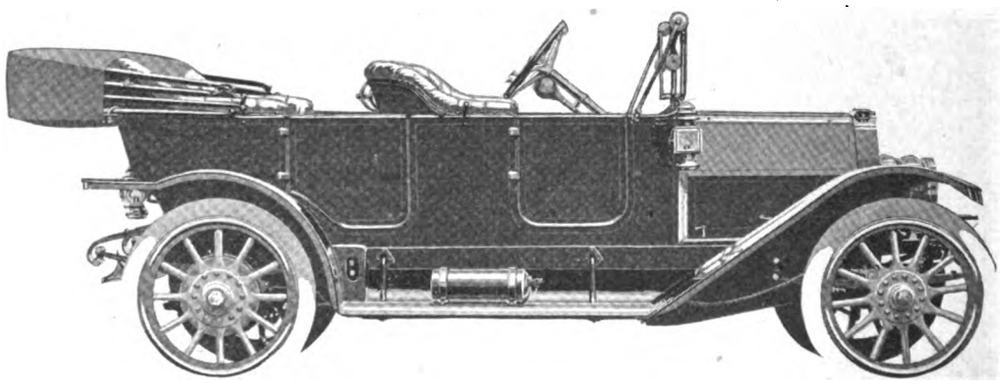
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THE MOTOR WORLD

Vol. XXXII New York, U. S. A., Thursday, September 12, 1912. No. 12

U.S. Motor in Receivers' Hands

Providence Creditor Forces Action and Big Corporation's Reorganization Plans Come to Naught—Sheriff's Keepers in Charge for Two Months.

Despite the 90-day extension granted by its creditors on June 15th last, and despite strenuous efforts to bring about reorganization without resort to the courts, last evening (Wednesday) at about nine o'clock the United States Motor Co. was thrown into the hands of receivers. The receivers who were apopinted by Judge Hough, in the United States District Court in New York, are W. E. S. Strong, who is the representative of the banking interests and who recently was made chairman of the United States Motor's Board of Directors, and Roberts Walker, a New York attorney. Their bond was fixed at $150,000, and they were directed to make an investigation of the corporation's affairs and report to the court not later than October 28th.

The petition in bankruptcy was filed by the Brown & Sharpe Mfg. Co., of Providence, R. I., which alleged that the corporation was insolvent and unable to meet its obligations. The Brown & Sharpe claim amounts to $70,000.

While the appointment of receivers occasions no great surprise, there are those who held fast to the belief that the company would escape bankruptcy proceedings, due to the financial strength and prominence of several capitalists who are identified with its affairs, and who were said to be so heavily interested that they could not afford to permit a failure.

As a matter of fact, however, all of four months ago the report was in circulation, and actually was published in Chicago, that the company was expected to be in the hands of a receiver at any moment. It was at that time that its shares dropped violently and that a crisis again was impending was indicated by quotations on the New York curb market yesterday when United States Motor preferred fell to 6 and common to 1⅛.

It transpires also that the writs of attachment sued out by several minor creditors who refused to agree to the 90-day extension, which writs it was officially stated would be "taken care of in due course," never were satisfied and that sheriff's keepers have been in charge of the company's New York office for some two months.

The Atlas Engine Works, of Indianapolis, first was brought down by the stringency in the United States Motor Co., which owed the Indianapolis concern a large sum and the failure of the E. R. Thomas Motor Car Co., of Buffalo, on August 29th was due to the "community of interest" which existed between the two companies; in fact, it has been freely charged that the United States Motor Co. actually owned the Thomas property.

Despite the stormy conditions that existed, it was given out that the plan of reorganization had made substantial progress, and only yesterday a definite report was current that the situation would be saved by the levying of a heavy assessment on the United States Motor stockholders and the payment of a high price for underwriting.

It is a matter of common knowledge that the $45,000,000 company was over-capitalized and long had been pinched for working funds, but as it greatly reduced its indebtedness after the original flurry, it appeared in a fair way of averting the crash that occurred yesterday.

The companies embraced by the United States Motor Corporation are the Stoddard-Dayton Motor Car Co., Columbia Motor Car Co., Maxwell-Briscoe Motor Co., Brush Runabout Co., Alden-Sampson Mfg. Co., Briscoe Mfg. Co., Providence Engineering Works and the Westchester Appliance Co.

Ask Uncle Sam to Investigate

New York Garage Owners Appeal to Federal Government for Probing of Gasolene Prices — Garagemen to Perfect New Organization.

Uncle Sam himself will be asked to insert his probe or divining rod into the gasolene situation, at least so far as concerns the price of that invaluable commodity. The decision to appeal to the Federal Government was the most striking outgrowth of the dinner of the New York garage owners, which occurred in Reisenweber's on Tuesday evening last, 10th inst. The dinner was designed specially to bring about discussion of what has come to be known as the gasolene situation, and before it terminated the expression was as free and diverse, and in many cases as blunt, as could be desired.

The occasion also gave rise to discussion of an organization for garage owners to replace the association which was formed about two years ago and died of dry rot in a twelvemonth. As a result, a committee of 15 was appointed to meet early next week to outline the details of the organization which practically was decided on at Tuesday's gathering; it will take the form of a corporation in which each member will hold one share, par value $10, and which for the first year, at least, will be free of dues and assessments. The sponsors of the new movement hope to profit by the experience of the old organization, in which many of them were enrolled.

Nearly 100 persons attended the dinner, the mass of garagemen being leavened by several interested car owners and as many representatives of tire or accessory houses, including at least three members of the staff of the Texas Oil Co.

Theodore K. McCarthy, who was counsel

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for the defunct garagemen's association, served as chairman of the occasion, which, however, was due largely to the initiative and efforts of C. H. Potter, of the Uptown Garage, a modest, pleasant-spoken man, who preferred to remain in the background.

Figuratively speaking, the gasolene was served with the cigars. Chairman McCarthy brought up the subject, pointing out wherein New York was being discriminated against in the matter of price, and remarked the need for action of some sort, which was emphasized by H. A. Heiser, also an attorney, who was introduced as representing the Automobile Owners' Association, which is an organization Heiser has in process of development. He declared that he had toured from New York to Minneapolis during the past summer, and everywhere he purchased gasolene cheaper than he had found it in New York. Of course, Standard Oil figured frequently in the evening's remarks, Heiser declaring his belief that its dissolution was little more than a sham. Whether or not this was the case, however, he stated that he had looked into his lawbooks and found a statute that might be brought to bear and which makes it an offense to agree on prices or to remain out of a given territory in order to reduce or prevent competition.

Apthorpe Sigall, who was active in the affairs of the defunct garagemen's association, told how during the life of the latter, the Standard Oil Co. once had raised the price of gasolene and had been brought to earth when the association contracted with the Texas Oil Co. for a supply of the fuel at about one-half cent per gallon less than the then prevailing rate. Standard Oil cut under the Texas quotation and Texas met the reduction, and in that way, Sigall stated, the price was reduced to nine cents. From gasolene, Sigall went to the troubles and poverties of garagemen. He declared he had been in business for three years without making more than a living and had remained in it because of mere "love." He thought, however, that the time was ripe to raise the price of storage all along the line and, if need be, to sell gasolene to the car owner at 17 or 18 cents instead of at 25 cents, which he thought would serve to show the car owner the difference between tweedledee and tweedledum. Later one of Sigall's competitors delivered a blunt cross-counter by frankly admitting that he, like most men in the business, had made a little money but desired to make more.

The talk of raising the storage rates persisted, however, and it developed that on September 1st the East Side garagemen, who have an organization of their own, had made an advance of $5 per month.

While the representatives of the Texas Oil Co. who were present said nothing, H. F. Hartjen, a representative of the Ajax-Grieb Rubber Co., stated that he was in a position to say that a certain oil company was ready to quote a reduced price if it could secure the business of a garagemen's association, the formation of which Hartjen vigorously advocated. The Texas men did not deny the soft impeachment which was contained in Hartjen's statement. Later, 35 of the garagemen, who pledged themselves to become members of the new association which will be born, enumerated their probable purchases of gasolene, the total amounting to something like 2,600,000 gallons per year, on which quantity it is supposed the Texas company will base its new figure.

It was not until near the close of the evening that the decision to call on Uncle Sam was reached, which action was urged by R. G. Betts, who said that quite apart from other discriminations which had been cited, he had certain knowledge that no later than Sunday last gasolene was selling at retail in Detroit at 13½ cents and 14½ cents, while garagemen in New York were paying 16 cents at wholesale and car owners from 18 to 25 cents. In view of such discriminations, he moved that it be the sense of the meeting that a committee of three be appointed to draft a suitable resolution calling on the United States Department of Commerce and Labor to investigate the causes that permit of such gross discrimination against the citizens of New York. The motion was adopted, and Messrs. Betts, Heiser and McCarthy were named as the committee to draft the resolution, which will be forwarded to the secretary of the Federal department.

The suggested organization of the new garage owners' association which, meanwhile, has been emphasized by about every other garageman present, finally took form in the appointment of a committee of 15, which will lay the foundation for such an organization at a meeting to be held on Monday next. The committee, which represents the four sections of New York, and also Brooklyn, is made up of Messrs. Potter, Krauss, Burrows, Stafford, Rowan, Sigall, Rainey, Joscelyn, Bierman, Wright, Hulse, McLaughlin and Dobbins.

Charles R. Zacharias, president of the Zacharias Garage Co., of Asbury Park, N. J., was one of the most interesting speakers of the evening. He dealt only lightly with the subject of gasolene, but in practical fashion pointed out several ways in which garagemen may improve their condition and increase their profits.

Rumors of Dutch "Gas" Invasion.

Although little of a definite nature has materialized, oil and gasolene producing circles evinced interest in a report which gained momentum early this week to the effect that the Royal Dutch Petroleum Co., which operates in the Dutch East Indies, was about to invade America. The story originated in the alleged purchase of sites on the Pacific Coast at points available for storage and distributing stations. The prevailing high price of gasolene in this country is given as one reason for the contemplated invasion, the Dutch company claiming, it is said, that it can import and sell at a profit under present prices. American refiners, however, are credited with stating that "if American refiners can sell 60 per cent. of their production in Europe at the equivalent of New York prices, how can the foreigners come here without the facilities for distributing and pay freight and successfully compete?"

Durant Finally Assumes a Presidency.

Overcoming a disinclination to serve in that capacity which long has been one of his peculiarities, W. C. Durant permitted himself to be elected president of the Sterling Motor Co. of Flint, Mich., which, as reported in the Motor World last week, has been incorporated with $300,000 capital stock and which will manufacture the six-cylinder engines that will be used on the cars identified with Durant's $65,000,000 Republic Motor Co., of which the Sterling enterprise will become a unit. The other officers of the latter are: J. Dallas Dort, vice-president; Curtis R. Hathaway of Detroit, secretary; Dr. E. H. Campbell of New York, treasurer; F. A. Aldrich, assistant secretary and treasurer. William H. Little has been appointed general manager of the company. The Sterling plant will be established in Flint, but until one is acquired, the six-cylinder engines will be produced in the Chevrolet factory in Detroit.

Six-Story Factory for General Vehicle.

Having acquired the American rights to the Daimler patents, so far as commercial vehicles are concerned, the plans of the General Vehicle Co. of Long Island City, N. Y., in that direction gradually are unfolding. That the plans are comprehensive is indicated by the fact that the company has let contracts for the erection of a six-story factory, 75 x 327 feet, on Star avenue, Long Island City, the estimated cost of which will be $400,000. It is understood that the structural plans will provide also for the subsequent erection of two six-story wings, the added cost of which will be about $200,000. When the plant is completed, it will be devoted not only to the output of the American Mercedes gasolene trucks but of the electric vehicle with which the General Vehicle name hitherto has been associated.

Republic's Minnesota Company Formed.

The Republic Motor Co. of Minnesota, Inc., with nominal headquarters at Stillwater, is the style under which W. C. Durant has incorporated that branch of the $65,000,000 Republic project. The authorized capital of the Minnesota company is $10,000 and its liability limit $1,000,000. The incorporators are Paul H. Guilford, of New York, and G. H. Sullivan and E. F. Manwaring, who are Stillwater attorneys. It is understood, however, that B. E. Stimson, who several months since relinquished the management of the Minneapolis branch of the United States Motor Co. will be the head of the Republic Motor Company's interests in Minnesota.

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UNIVERSAL TRUCK TROUBLES GROW

Instead of Effecting Settlement, Wheeler, Who Was "Ousted," Files Delayed Complaint—Asks for Receiver.

Although it was stated nearly two months ago when George Wheeler instituted legal proceedings against the Universal Motor Truck Co. of Detroit, the Universal Truck Co. of New York and several men who are interested in these concerns that a settlement was probable, none appears yet to have been effected, and that a peaceable settlement is afar off is indicated by the action of Wheeler, who this week filed his long delayed complaint in the case, which, among other things, asks for the appointment of a receiver.

The complaint states, as was told in the Motor World of July 25, that Wheeler invested heavily in the Universal Truck Co., which was New York dealer for the Universal Motor Truck Co., and was practically "frozen out" in April when there was effected a reorganization which Wheeler claims was grossly illegal. The New York agency then was taken over by the Detroit company as a branch. Wheeler claims he owns 350 of the New York company's 500 shares of stock and alleges that all procedure under the new arrangement is unlawful. He asks that it be stopped and that a receiver be appointed for the New York company pending the result of the action. The men named in the complaint are Frederick K. Parke, Howard W. Walton and Samuel Mann, the first named being the prime mover in the deal with Walton, the former head of the dealership concern, as lieutenant. Mann superseded Wheeler as treasurer of the New York company at its April meeting.

Court of Appeals Favors Prest-O-Lite.

Although Judge Kohlsaat in the United States District Court in Chicago recently handed down an opinion declaring that the Prest-O-Lite patent had expired, and despite the fact that copies of this decision were placed in the hands of the justices of the United States Court of Appeals for the Eighth Circuit, this branch of the judiciary, Judge Sanborn writing, last week decided emphatically for the Prest-O-Lite Co. in an infringement action brought against the Fireball Gas Tank Co. of St. Louis, Mo. The claim was that the Fireball company had been violating the Prest-O-Lite patent, No. 664,383, by manufacturing new tanks and refilling old Prest-O-Lite tanks. The district court granted a preliminary injunction and the Fireball company appealed.

The decision is similar to others which have been handed down supporting the Prest-O-Lite claims, but in this one there appears mention of the unfavorable decision rendered by Judge Kohlsaat and which won attention because of its variance with the majority of decisions rendered in several others cases of the sort. Judge Sanborn said that notwithstanding Judge Kohlsaat's ruling, he felt called upon to hold the Prest-O-Lite patent is alive and to otherwise favor the plaintiff.

Aristos Fails to Press Disco Suit.

Despite the sweeping and specific charges levelled at the Ignition Starter Co., of Detroit, makers of the Disco engine starter, by the Aristos Co. of New York, its former eastern representative, in the countersuit for $304,000 damages which was filed in the Federal court in Detroit early last month the Aristos Co. was not represented in court on Thursday last, 5th inst., when the summons became returnable. The Disco people, however, entered an appearance and were prepared to fight the case, in which connection it transpires that although the press was given access by Aristos representatives to a copy of the voluminous complaint which was supposed to have been served on the Ignition Starter Co., or filed in court, nothing of the sort had been done, a summons only having been applied for and issued.

Veitch Company to be Dissolved.

Internal dissensions which caused the abandonment of its projected factory in Dayton, O., as reported in the Motor World of 29th ult., have proved so serious that the Veitch Motor Mfg. Co., itself will be dissolved. The company was incorporated about two months since under the new law of New York which permits the issue of stock without a specified par value and the dissolution proceedings accordingly will be conducted in conformity with the New York statutes. A formal meeting for the purpose has been fixed to occur October 2nd. J. S. Harris, of Jersey City, is president of the company, with which the name of William G. Rockefeller also has been associated.

Peerless Issues More of Its Stock.

To provide for contemplated extensions, the Peerless Motor Car Co. of Cleveland has placed on the market the unused portion of its $3,000,000 capital stock. It is understood that certain stockholders have agreed to purchase at par all of the stock that is not absorbed by the public. The money derived from the same is expected to cover the company's needs for two years. The shares offered for sale amount to $1,150,000.

Weed Sues the Pittsburgh Kaufmanns.

Alleging that Kaufmann Brothers, who operate a big department store in Pittsburgh, Pa., have been selling cross chains, side chains and hooks in violation of the Parsons patent, No. 723,299, the Weed Chain Tire Grip Co., of New York, has commenced action in the United States District Court, in that city. A preliminary injunction is asked in a motion which is returnable next Wednesday, 18th inst.

COMMISSION HALTS FREIGHT RAISE

Interstate Commerce Body Holds Up Pacific Coast Rates Until End of Year—N. A. A. M. Fighting New Tariff.

Until December 31st, at least, the railroad companies will not be able to bring to bear the increased carload rates which they sought to apply on automobiles destined for Pacific Coast points. They were to have become effective on September 2nd, but so numerous and so strong were the protests lodged that the Interstate Commerce Commission has ordered the effective date of the new tariff postponed until December 31st next. In the interim, it is probable that the commission will hold a meeting, at which the propriety and justice of the proposed advances will be discussed.

The National Association of Automobile Manufacturers, represented by J. S. Marvin, general traffic manager, is among those who entered objections and who will strenuously fight the higher rates, which on automobiles in carload lots are as follows:

Three dollars and thirty cents from New York, Pennsylvania and New England, $3.20 from Buffalo-Cleveland-Pittsburgh territory and $3.10 from Detroit and other points in Michigan, western Ohio and Indiana; the rate from all these territories now being $3 per 100 pounds.

As explained by Marvin, the proposed tariff is the result of the so-called intermountain cases which brought into question the propriety of making rates to the Pacific Coast points lower than to intermediate points. The new tariffs would discontinue the practice, in so far as articles which it is not practicable to ship by water are concerned. Some 325 commodity rates heretofore published on such articles are omitted from the new tariffs, leaving the class rates, which are considerably higher, to apply. The blanket rate from all territories on such articles would be replaced under the proposed tariffs by a sliding scale, according to groups and distances; the figures named on automobiles are the same as the rates now in effect to such points as Reno, Nev.

Two Little-Knowns Likely to Merge.

The American Auto Corporation, of New Albany, Ind., which acquired the assets of the bankrupt American Automobile Mfg. Co., of that city, whose famous "clink of gold" stock-selling campaign is dear to memory, is likely to merge with the Advance Power Co. of Chicago, whatever that may be. Neither concern ever has cut a figure in the industry, but the American corporation has authorized its directors to consummate consolidation, which, when it is effected, will give the merged companies a capitalization of $1,000,000, so 'tis said.

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HYDRAULIC TRANSMISSION NEARER

Fulton Heads Indiana Company Formed to Exploit Cheyne's Invention—Pumps That Provide Speed Changes.

H. H. Fulton, who at one time was interested in another gearless transmission and who also is president of the Moisture Record Co., of Indianapolis, is the head of the Hydraulic Transmission Co., of that city, which recently was incorporated with an authorized capital of $200,000. William K. Milholland, of the Milholland Machine Co., in the Industrial Building, is vice-president; Paul Milholland, the son of W. K., is secretary, while Hugh R. Richards, president and general manager of the Noelke-Richards Co., a wealthy Indianan, is treasurer. Ernest Milholland, another son of W. K., in interested in the company as a stockholder.

The inventor of the hydraulic clutch is F. H. Cheyne, of the Cheyne Electric Co., who worked on the clutch for from 12 to 14 years and now claims that it is a success. A working model has been tried out in the Milholland shop, which has been turned into an experimental workshop, and a practical clutch will be tried out in an automobile within 30 days.

It is the intention to manufacture the clutch, which is fully patented, for the trade, while the company expects to sell shop rights to certain large automobile companies should these concerns care to utilize the device.

It is claimed that not only will the hydraulic device eliminate the fly wheel, transmission, clutch and gear wheels, but that it can be substituted for all these parts at just about one-half their cost.

As described by W. K. Milholland, the Cheyne clutch takes the form of a closed cylinder about the size of a flywheel, having a series of eight hydraulic pumps on the inside. Four of the pumps act as driving pumps and the other four act as measuring pumps. The driving pumps rotate the same speed as the crankshaft—at fixed speed—while the measuring pumps are changed at will in regard to their stroke—from the full stroke of the driving pumps to no stroke at all.

When the driven pumps are at the same stroke as the driving pumps, there is no action on the driven shaft. As soon as the driven pumps' stroke is changed from the stroke of the driving pumps, there is a difference in speed between the driving shaft and the driven shaft. When the driven pumps are changed to no stroke at all, the driven shaft and driving shaft run at the same speed. For instance—if the crank shaft should run at 1,000 revolutions per minute and the driven pumps have no stroke, the two shafts will run at the same speed. Should the driven pumps have one-half the stroke that the driving pumps have, then the driven shaft would run one-half the speed of the driving shaft.

In testing out with a prony brake, it has been found that when the two shafts run at the same speed, there is no loss of power.

Hayes Adds $250,000 to Capitalization.

To retire a large part of its floating indebtedness and to furnish working capital for its increased business, the Hayes Mfg. Co. of Detroit has increased its capital stock from $500,000 to $750,000. The new stock consists of 7 per cent. cumulative preferred shares redeemable, in whole or in part, after January 1, 1915, at 110. The directors of the company already have subscribed for one-half of the new issue, leaving $125,000 to be offered to the public at par. The original shares, to the amount of $500,000, now became common stock.

Day to Manage General Motors Trucks.

William L. Day, who recently resigned the sales management of the Mitchell Motor Car Co. of Racine, Wis., has been elected vice-president and general manager of the General Motors Truck Co. of Pontiac, Mich. Gleeson Murphy, who previously filled those offices, has returned to his original duties as assistant to the president of the General Motors Co. Before becoming identified with the automobile industry, Day for 27 years was engaged in the agricultural implement business.

Court Declares King a Bankrupt.

Growing out of the petition in bankruptcy filed by three creditors on August 27, the King Motor Car Co. of Detroit, formally was adjudicated a bankrupt on Thursday last, 5th inst. Its liabilities are $161,469 and its assets $130,088. Lee E. Joslyn, referee in bankruptcy, has called a meeting of the creditors for Tuesday next, 17th inst.

Thomas Branch to be Discontinued.

One of the immediate results of the failure of the E. R. Thomas Motor Car Co., of Buffalo, N. Y., which occurred on the 29th ult., will be the discontinuance of its long established branch in New York City. The discontinuance will leave at liberty C. S. Henshaw, its manager, who has been in the Thomas service for several years.

Michelin Judgment Against Garagemen.

David Spear and his partner, named Clark, who did business at Rockaway, Long Island, N. Y., as the Woodmere Garage, are debtors in a judgment filed this week in the New York county clerk's office by the Michelin Tire Co. of Milltown, N. J. The bill, with costs, aggregates $258.90.

Bill that Nokik Crank Left Unpaid.

Alleging that the Nokik Crank Sales Co., which formerly did business in New York City, failed to pay a bill for advertising, the Touring News Co. sued and this week filed judgment in the New York county clerk's office. The amount is $48.30.

ISSUE WARNING OF CAR SHORTAGE

Railroad Companies Declare Shippers' Lack of Diligence Again Will Cause Embarrassment—Some Dealers Blamed.

To obviate as far as possible the shortage of freight cars which marked the fall and winter months, the railroad companies and railroad associations are issuing warnings that unless shippers exercise real diligence embarrassment will recur. They declare that in view of the unusually heavy movement of crops and other traffic that is anticipated, it will be necessary to give particular attention to prompt loading and unloading of freight cars, and also to loading as much freight as possible into each car, in order that it may perform maximum service.

The railroad authorities place on the dealers a large part of the blame for the embarrassment suffered last winter by the automobile industry, due to its inability to obtain a sufficient number of cars to promptly take care of outputs. They maintain that dealers delayed taking deliveries and criticise manufacturers for continuing to load and forward automobiles to such dealers, which practice took a large number of automobile freight cars out of service for unduly long periods and at a time when they were badly needed. In order to relieve the situation as far as possible, and to prevent a repetition of such a state of affairs, J. S. Marvin, general traffic manager of the National Association of Automobile Manufacturers, has issued an urging to automobile manufacturers. In it he says:

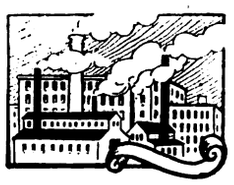
"We recommend that you request shipments of supplies in units as large as possible, and that parties shipping material and supplies to automobile factories use automobile freight cars if they can be secured, inasmuch as this will bring to you cars which you can re-load.

"When forwarding automobile shipments to western points, try to secure for same freight cars owned by Western railroads, loading Eastern lines equipment as much as possible to Eastern points to and via the lines owning the cars."

Injunction Against "League" Continued.

The temporary injunction obtained by the Ford Motor Co. restraining the International Automobile League, of Buffalo, N. Y., from selling or advertising Ford cars at less than list prices, or otherwise infringing the Ford patents, still is in force. It was granted on July 22nd last, the order to show cause why the injunction should not have been made permanent being returnable on Friday last, 6th inst. At that time, however, Judge Hazel, sitting in the United States District Court in Buffalo, granted an extension of the date to October 1.

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THE WEEK'S INCORPORATIONS




Detroit, Mich.—Traveler Motor Car Co., under Michigan laws, with $15,000 capital; to deal in motor cars.

Portland, Ore.—Poquet & Pick Auto Sales Co., under Oregon laws, with $5,000 capital; to deal in motor cars.

Pierre, S. D.—South Dakota Automobile Co., under South Dakota laws, with $25,000 capital; to deal in motor cars.

Detroit, Mich. — National Automobile Owners' Protective Association, under Michigan laws, with $2,000 capital.

Wilmington, Del.—L. A. W. Motor Truck Co., under Delaware laws, with $200,000 capital; to manufacture motor trucks.

Minneapolis, Minn.—Dahl Punctureless Tire Co., under North Dakota laws, with $6,000,000 capital; to manufacture tires and tire filling compounds.

Benton, Ill.—Benton Motor Car Co., under Illinois laws, with $75,000 capital; to deal in motor cars. Corporators—Harry Stetlar, W. S. Cantrell, A. H. Fraufielder.

Chicago. Ill.—Parker Motor Co., under Illinois laws, with $5,000 capital; to manufacture motors. Corporators—Hugo W. Schnetzky, Frederick D. Parker, Archie E. Cole.

Butte, Mont.—Butte Automobile Co., under Montana laws, with $25,000 capital; to deal in motor cars. Corporators—C. M. Goodenberger, Richard M. McGrew, Chas. Fasel.

Chicago, Ill.—Tatco Co., under Illinois laws, with $20,000 capital; to deal in motor car supplies. Corporators—Frederick S. Donnell, Frank M. Welles, Sheridan Black.

Wilmington, Del.—Auto Service & Supply Co., under Delaware laws, with $15,000 capital; to deal in motor car supplies. Corporators—F. A. Webb, B. I. Bothe, A. Hindle.

La Crosse, Wis.—General Motor Car Co., under Wisconsin laws, with $10,000 capital; to deal in motor vehicles. Corporators—Joseph P. Kriet, Louis L. Fox, M. W. Rybold.

Chicago, Ill.—Parker Motor Co., under Illinois laws, with $5,000 capital; to deal in motor cars. Corporators—Hugo Schnetzky, Frederick D. Parker, Archie E. Cole.

Columbia, Ohio—Columbia Automobile Co., under Ohio laws, with $1,500 capital; to deal in motor cars. Corporators—Sam Lewis, John O. Russell, Ray Conover, Jas. T. Page.

Chicago, Ill. — Madis Auto Livery Co., under Illinois laws, with $2,500 capital; to operate an automobile livery. Corporators—S. J. Andalman, J. R. Landes, Hortense Stretton.

Boston, Mass.—P. & P Sales Co., under Massachusetts laws, with $50,000 capital; to deal in motor cars. Corporators—Rufus B. Skinner, Grace B. Bowman, Lydia A. Brimmer.

Worcester, Mass.—Morgan Motor Truck Co., under Massachusetts laws, with $300,000 capital; to manufacture motor trucks. Corporators—C. B. Foster, Enan P. Jones, and others

Los Angeles, Cal.—Carpenter Motor Sales Co., under California laws, with $50,000 capital; to deal in motor cars. Corporators—A. M. Young, Leigh R. Carpenter and others.

Springfield, Mass.—Harley Co., under Massachusetts laws, with $50,000 capital; to operate a garage and machine shop. Corporators—Leon J. Harley, Leon J. Harley, Jr., and others.

Seattle, Wash.—Rambler Motor Car Co., of Seattle, under Washington laws, with $5,000 capital; to deal in motor cars. Corporators—D. W. McNaughton, E. S. Booker, N. J. Morehouse.

Milwaukee, Wis.—Lozier Livery Co., under Wisconsin laws, with $25,000 capital; to operate a motor livery. Corporators—Robert Knowles, Robert Druecke, F. W. Loomis.

Owensboro, Ky.—Ames Motor Car Co., under Kentucky laws, with $100,000 capital; to manufacture motor cars. Corporators—F. A. Ames, G. W. Yeeman, H. M. Robbins, Charles T. Smith.

Ft. Wayne, Ind. — Drage-Harris Motor Truck Sales Co., under Indiana laws, with $10,000 capital; to deal in motor trucks. Corporators—Frank A. Drage, Donald H. Harris, Herbert L. Somers.

Highland Park, N. J.—Walter Williamson Automobile Co., under New Jersey laws, with $10,000 capital; to deal in motor cars. Corporators—W. M. Williamson, Watson Whittlesey, Vernon J. Miller.

Birmingham, Ala.—Robertson Tire & Auto Co., under Alabama laws, with $2,000 capital; to deal in motor cars and tires. Corporators—J. E. Vandergriff, E. R. Minhinette, Jr., W. W. Robertson.

Trenton, N. J.—General Supply & Equipment Co., under New Jersey laws, with $25,000 capital; to deal in motor car supplies. Corporators — William J. Pierrepont, William U. Ale, William B. Housel.

Brooklyn, N. Y.—Brooklyn Terminal Garage & Machine Co., under New York laws, with $10,000 capital; to operate a garage and machine shop. Corporators—Donald B. Abbott, 125 Gates avenue; Chas. E. McMahon, Joseph D. Fackenthal, both of 165 Broadway, New York City.

Buffalo, N. Y.—Continental Motors Corporation, under New York laws, with $100,000 capital; to manufacture motors. Corporators—Gordon F. Matthews, Frank V. Whyland, Allen E. Choate.

Charlestown, S. C.—Garage & Supply Co., under South Carolina laws, with $5,000 capital; to operate a garage and deal in motor car supplies. Corporators—Walter B. Wilbur, William C. Wilbur, Sarah E. Quinn.

Toledo, Ohio — Landman-Griffith Motor Co., under Ohio laws, with $10,000 capital; to deal in motor cars. Corporators—Chas. P. Landman, Charles K. Freidman, Warren W. Griffith, Hattie Landman, Gertrude D. Griffith.

Indianapolis, Ind.—Hartford Suspension Co., a New York corporation certified to do business in the state of Indiana with $100,000 capital. Corporators—Edward V. Hartford, John A. Hartford, Arthur G. Hoffman, all of New York City.

Cleveland, Ohio—Automobile Electric Appliance Co., under Ohio laws, with $20,000 capital; to manufacture automobile devices. Corporators—Paul S. Crampton, Charles R. Brown, Jr., Guy W. House, Frank B. Fults, Henrietta Davis.

Cincinnati, Ohio—Cincinnati Automobile Club Co., under Ohio laws, with $25,000 capital. Corporators—D. McKim Cook, L. J. Merkel, Gustav W. Drach, A. O. Streitman, Charles W. Ireland, L. S. Colter, C. L. Bonifeld, W. M. Perrin, H. L. Gordon.

New York, N. Y. — Salvini Electrical Horn Mfg. Co., under New York laws, with $50,000 capital; to manufacture motor car appliances. Corporators—Edwin Salomon, 103 East 143rd street; Godfrey S. Salomon, 65 West 45th street; Salvatore Salvini, 209 East 116th street.

Changes of Capitalization.

St. Louis, Mo.—St. Louis Motor Truck Co. from $17,500 to $22,500.

Detroit, Mich. — Hayes Mfg. Co. from $500,000 to $750,000.

Detroit, Mich.—Kelsey Wheel Co. from $500,000 to $1,000,000.

Jackson, Mich.—Baker Drop Forge Co. from $65,000 to $100,000.

Detroit, Mich.—Sibley Motor Car Co. from $80,000 to $150,000.

Schenectady, N. Y.—General Electric Co. from $80,000,000 to $105,000,000.

Indianapolis, Ind.—Marion Motor Car Co. from $1,125,000 to $1,250,000.

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EVERITT CARS RENAMED FLANDERS

Big "Six" Continued With Added Equipment and at Higher Price—Little "Six," a Near-Duplicate, at $1550.

Although only about three months ago, when what then was described as a "change of fortunes" resulted in the changing of the name of the Metzger Motor Car Co. of Detroit, to the Everitt Motor Car Co., it was declared in positve terms that the Everitt models would be continued during 1913 absolutely without alteration of mechanical construction or prices, it was konwn to insiders that the announcement was what is sometimes termed a "diplomatic statement."

Since that time the Everitt Motor Car Co. has changed its name to the Flanders Motor Co. and has let the public know that four-cylinder cars would be abandoned and that "sixes" only, and at new prices, will be produced. Details of these "sixes," while more or less carefully guarded, have been in the possession of Everitt agents for at least two weeks. They indicate that henceforth Everitt cars will be styled Flanders cars and that the line will be made up of two models, one styled the "50-6" listing at $2,250 and the other the "40-6" at $1,550, which is at least $250 higher than a preliminary general announcement had foreshadowed.

The 1913 Flanders "50-6" is substantially the 1912 Everitt "six" with the addition of a Gray & Davis electric lighting and starting system, a few detail changes and a new higher price. It retains the block-cast motor with a bore and stroke of 4 x 4¾ inches, respectively, but a gear pump for the circulation of oil has been substituted for the former vacuum splash system, and a visible oil feed mounted on the dash replaces the feed on the engine and gravity feed to the carburetter has given way to pressure feed, the gasolene tank being located at the rear of the chassis. The gearset gives three forward speeds. The rear axle is of the three-quarters floating type. A new steering gear is employed, with a notched wheel. The wheels are 36 inches in diameter, and the tires have been increased to 4½ inches all round and, as formerly, are on demountable rims. The wheelbase is 127 inches. Splitdorf dual ignition is retained. The equipment includes such "fancy" extras as a cigar lighter, electric light plugs in various places for plugging in an extension lamp, dashboard illumination, Warner speedometer, etc. This chassis will be fitted with bodies designed to carry 2, 4, 5 or 7 passengers.

The smaller car, the Flanders "40-6" closely resembles the "50-6." The motor has cylinders of 3⅝ x 4½ inches bore and stroke respectively, and the wheelbase is 115 inches and the tires 34 x 4 inches. Otherwise the specifications of the larger car apply, even to the motor starter and the "fancy" equipment. The price will be $1,550; only one type of body will be mounted on this chassis, a five-passenger touring body.

Prominent Men in Castings Project.

Backed by men of prominence, the Peninsular Steel Castings Co. has been organized in Detroit to produce crucible steel castings of all sorts—but chiefly for the automobile industry—under the F. J. Nice patents which are claimed to eliminate blow-holes. It already has purchased the former Michigan Bolt and Nut Works at Iron and Wight streets in that city, which property is being remodeled and re-equipped for its new purposes.

The officers of the company are: President, Harrison Geer, Grand Trunk system attorney; vice-president, Guy R. Creelman, Fenton, Mich.; secretary and treasurer, Mathew Finn. These three and the following make up the board of directors: W. A. Geer, Detroit; A. J. Johnson, former mayor of Pontiac; C. A. Richmond, Pontiac, and W. R. Anderson, of the Advance Machine Co. and former manager of the Anderson Forge Co. The superintendent is J. H. Tobin, Jr., formerly with the Prime Steel Co., of Milwaukee, and later secretary of the Swedish Crucible Steel Co., of Detroit. The manager of sales and production is F. W. Prothero, formerly with the Whitney Steel Co., of Muncie, Ind., and later sales manager of the Swedish Crucible Steel Co.

Seeks to Recover Preferential Payment.

In an endeavor to recover some $2,500 for the creditors, the amount of an alleged preferential payment, Alan Fox, as trustee in bankruptcy of the Saxon Lamp Co., has brought suit in United States District Court for the Southern District of New York against the East Side Metal Spinning Co., of New York. Fox alleges that before the Saxon company was forced to suspend operations it paid about $2,500 to the metal spinning concern, which payment, he charges, was illegal.

Wishart-Dayton Assets to be Auctioned.

Such relics as remain of the once promising Wishart-Dayton Auto Truck Co., of New York, which went to smash last month, will be disposed of at public sale on Wednesday next, 18th inst., by order of the court. One three-ton truck and several small parcels of tires, grease, oil and automobile accessories, now stored at the New York Automobile Garage, 522 West 36th street, constitute the goods that will be auctioned.

Auction Marks End of Dorian Rim.

The effects of the bankrupt Dorian Remountable Rim Co., of New York, are to be sold at auction on Tuesday next, September 17th. The property includes a considerable quantity of machinery, 25,000 Dorian rims and one motor truck.

MEN WHO HAVE SHIFTED POSITIONS

Resignations and Promotions That Served to Place Many Workers in New Places —Few Leave the Trade.

Garvin Denby has been appointed sales manager of the Federal Motor Truck Co. of Detroit. Previously he was assistant to the president of the Solvay Process Co.

John Ferguson has been appointed chief engineer of the Cartercar Co. of Pontiac, Mich. Previously he was one of the assistant engineers of the Studebaker Corporation.

C. L. Morgan has resigned the sales management of the General Motors Truck Co. at Pontiac, Mich., to become eastern sales agent for a billing machine company. His new duties carry with it removal to New York.

J. W. Martin has been appointed manager of the branch which the Oakland Motor Co. has established in Minneapolis at 1518-1520 Hennepin avenue. Martin is well known to the automobile trade of that vicinity.

Charles E. Sweeney has been appointed advertising and publicity manager of the Kline Motor Car Corporation of York, Pa. For five years previous Sweeney was a member of the reportorial staff of a York newspaper.

R. B. Curtiss, sales manager of the Royal Equipment Co. of Bridgeport, Conn., has resigned that office to become a district sales manager for the Chase Motor Truck Co. of Syracuse, N. Y. He will make Cleveland, O., his headquarters.

John W. Hayden, former manager of the United Motors Co.'s Indianapolis branch and at one time manager of the National branch in Chicago, has joined the staff of the Nyberg Automobile Works of Anderson, Ind. He will act as a special representative in Western territory.

Harry S. Moore, one of the veterans of the trade in the Central West and who latterly has handled Locomobile cars in Cleveland, O., has been appointed manager of the branch in that city, which just has been established by the Stutz Motor Car Co. of Indianapolis. Temporarily it will be located at 1761 Crawford road, which is Moore's old address.

G. L. Willman has been appointed sales manager of the Warren Motor Car Co. of Detroit to succeed George D. Wilson, who has been transferred to New York City, where he will serve as Eastern sales manager. Although a comparatively young man, Willman has had varied experience among other things having been identified with the Detroit Board of Commerce, during the time that Lucius E. Wilson, now general manager of the Warren company was secretary of that organization.

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Floyd Jones has opened a repair shop in edrick, Ia.

H. J. Quigley is about to build a garage Morris, Minn.

Jesse Patterson has bought the Ralph olt Garage in Lodi, Wis.

J. M. Kolb, of Oceanside, Cal., is about to ıild a garage, 50 x 100 feet.

E. E. Frizell of Laurel, Kan., has sold his ırage to John H. Gerhardt.

J. P. Talcott and his son have a new gar-ge under way in Williams, Ia.

A. G. McClary is planning to build a gar-ge, 44 x 132 feet, in Defiance, O.

Wagner Stitaman, of Anderson, Ind., has ıld the Central Garage to O. C. Brown.

H. F. Kellogg has sold his interests in the arner (Ia.) Auto Co. to C. M. Barnes & ɔn.

J. W. Peyton, of Springfield, Tenn., has ganized a stock company to operate a ırage.

Edward Schreiter has entered the trade Grand Rapids, Mich., at 1000 Woodward enue.

F. C. Orr has entered the selling field in cksonville, Fla. He has the Pratt-Elk-ırt line.

George A. Thrower and B. Fisher, of Des oines, Ia., have purchased the Stuart (Ia.) uto Co.

Orley England has purchased the garage rmerly operated in Bethany, Mo., by Bert easton.

J. B. Gill of San Bernardino, Cal., has se-ıred permission to build a garage; it will ɔst $5,000.

Edward Junck, formerly of Dallas, Tex., about to open a repair shop in Fort nith, Ark.

Fred Moore has completed arrangements r building a garage, 42 x 115 feet, in ɔencer, Ia.

Frank O'Donnell, of Clara City, Minn., ıs sold his garage to Charles Schlagel of inneapolis.

Daniel Hedderly, both junior and senior, ıve entered the used car trade in Min-ɛapolis, Minn.

E. Hardner of Genoa Junction, Ill., has ıld his garage business to Julius Luther ıd Ben Shuren.

George McWilliams of Chillicothe, Mo., ıs let the contract for a two-story gar-ge, 56 x 120 feet.

Susdorf & Johnson, garage operators in ibson, Ill., have dissolved; Elmer John-ɔn has withdrawn.

Miner, Read & Tullock, wholesale gro-ɛrs in New Haven, Conn., have had plans prepared for a one-story brick garage, 26 x 75 feet.

Edward Grover and Edward Scheuer are about to open up a garage and repair shop in Two Rivers, Wis.

E. C. Sawyer, Chalmers dealer in Asheville, N. C., has taken over the Alco truck agency in that town.

The Long Beach (Cal.) Electric Garage has been bought by Emil Lindstrang, B. H. Kent and J. E. Carr.

Plans have been made for a new garage in Milford, N. H. Walter C. Billings heads the promoting company.

E. E. Harlan, of Tama, Ia., has disposed of his garage to Clair Cory of Columbia township, in the same state.

Caldwell & Denney, real estate dealers in Whittier, Cal., have gone into automobiles; they have the Oakland.

Hill & Jenkins have sold the Jamestown (Cal.) Garage to George H. Koster; the latter already has assumed charge.

S. C. Davis, of St. Louis, Mo., has secured permission to erect a garage at 5334 Waterman street; it will cost $3,000.

W. W. Bagley, W. H. Heinzerling and J. I. L. Sanders have purchased the Third Street Garage in Sedro Woolley, Wash.

Galen Gray, of Bluffton, Ind., has sold a part interest in the Auto-Electric Garage to William Dowty; the latter has been a farmer.

N. S. Nelson & Son have bought C. O. Kittleson's garage, machinery and supplies in Forest City, Ia. The transfer involved $2,000.

Matthew Koverman and Peter Service have bought the Central Auto Station in New Britain, Conn., from Raymond S. Styles.

Mohr, Hurto & Beldon will be the style of a new firm for which a garage is being built in Zearing, Ia. F. L. Beldon will be manager.

John Brightop of Hollis, Kan., has bought the Kirkpatrick Garage in Cylde, in the same state; the business carries with it the Ford agency.

Bids are being secured on a three-story brick garage to be erected on Highland avenue, Pittsburgh, Pa., for Wm. R. Laird; it will cost $30,000.

Permission has been granted to S. E. Olsen of Minneapolis, Minn., to erect a brick veneer garage; it will represent an expenditure of $7,500.

A day and night taxicab service is planned in Dongon Hills, Staten Island, N. Y. The promoters are M. Shields, W. Wright and W. C. and Frank Borden.

Schalm-Mills & Co. is the style chosen for a new business established in Osakis, Minn., by F. A. Schalm and S. E. Mills; they will operate a garage.

A. H. Wilson, formerly manager of the sales department in the Alhambra (Cal.) Garage, has entered business for himself; he has taken on the Overland.

Fred Raether has sold his interests in the Juneau (Wis.) Auto Co. Julius and Baldwin Kuntz, his partners, were the purchasers, and they will continue the business.

Permission has been granted to K. L. Ames, of Evanston, Ill., to build a one-story garage at 1460 Asbury avenue; the application named $2,000 as the cost.

J. H. Pearson, formerly of Homestead, Ore., has entered the tire filler field in Portland, with an establishment at 605 Washington street; he will handle Essenkay.

M. C. Pollack, H. D. Lantz and A. C. Ford have entered the trade in Good Hope, Ill., under the style Pollack, Lantz & Ford; they will handle the Ford and Overland cars.

P. J. Albers and H. H. Hagedorn, saloon proprietors in Luverne, Minn., have sold out and will open a garage and salesrooms in what formerly was the Manitou livery stable.

The Genesee Auto Sales Co., of Utica, N. Y., a co-partnership, has been dissolved; the firm conducted a garage at 36½ Genesee street and had the Mercer and Marmon agencies.

W. Kieffer Hull, who has traded for some time in Hagerstown, Md., as the City Garage, has sold out; the Essenkay Co. of Chicago is the purchaser and will make the business a branch.

The Madison Garage on Madison avenue, Paterson, N. J., has been purchased by Richard Meyers of the Consumers' Baking Co. E. C. Searls, the former owner, retires from the business.

Henry Roberts, who has been associated with his father in the automobile business for several years in Rockford, Ill., has branched out for himself; he will handle the Hudson in Rockford.

Andrew Rasmussen of Emmons, Minn., has purchased the interests of the Opdahls brothers in the Emmons Auto Co. The business now will be carried on by Rasmussen and Carl and Otto Olsen.

R. G. Dow and A. L. Eagles, former owners of a garage on Union avenue in Los Angeles, Cal., have sold out to Frank Brown, a recent arrival on the Coast from Oklahoma; the consideration was $25,000.

W. A. Williams, of Dayton, O., has

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opened headquarters in Lima, in the same state, and will distribute Buick and Peerless cars through ten counties; heretofore this business has been handled from Dayton.

The Auto Supply Depot of 178 Western avenue, St. Paul, Minn., has been purchased by Fred W. Olliver and Leo O. Grange; Olliver formerly was president of the Minnesota State Chauffeurs' Association.

The Mercer Motor Sales Co. has been organized in Minneapolis to handle that make of car in Minnesota and part of Wisconsin; the company will locate at 8th street and Hennepin avenue. C. S. Cromwell is manager.

The Hibbing (Minn.) Automobile Co., a co-partnership comprising J. R. Pomeroy and M. J. McGovern, has been dissolved; the interests of both men were sold to O. W. Oldham, who will continue the business.

J. M. Kirkwood and E. A. Watkins have formed the Kansas Motor Car Co. in Wichita, and will handle Studebaker cars and Goodrich tires; Watkins was president of the Citizens' State Bank in Manchester, Okla.

Mrs. Abbie A. Goodwin of Los Angeles, Cal., has had plans prepared for a garage which she will have erected at Union street and Broadway; it will cost $12,500 and the schedule calls for its completion by October 3.

The Hayes Estate of Pittsburgh, Pa., is making preparations for the erection of a one-story brick and concrete garage at Highland avenue and Broad street; the specifications call for an expenditure of $15.000.

Albert Marienthal and A. M. Smallwood have opened up in Saginaw, Mich., under the style City Hall Garage; Smallwood still continues to operate the Saginaw Vulcanizing Works, which he has conducted for some time.

A. C. Neureither, who has been identified with the automobile trade in Grand Rapids, Mich., for 14 years, has established himself as Little dealer; his last previous connection was as salesman for the Rambler agency.

L. A. Smith, formerly a salesman in the Studebaker branch in Dallas, Tex., has entered business for himself; with G. L. McKinney, of Amarillo, he has secured the Studebaker agency for Hunt, Collin and Rockwall counties.

The South Brooklyn Auto Livery and Sales Co. has entered the trade at 348-56 13th street, Brooklyn, N. Y. It has 25,000 square feet of floor space and makes claim to being the largest garage in Brooklyn. R. C. H. cars are stocked.

Carpenter Motor Sales Co. is the style of a new entry to the trade in Los Angeles, Cal. A. M. Young and Leigh R. Carpenter, principals in the venture, have selected a location at Pico and Hill streets; Paige-Detroit and Dorris cars will be stocked. The capitalization is $50,000.

J. D. Perry Lewis, who has been associated for years with the Halsey Automobile Co. in St. Louis, Mo., has established himself as a dealer; he represents the Moon car in St. Louis and vicinity and certain other territory of Missouri.

The Overland Motor Car Co., of Hutchinson, Kan., has sold its garage, repair shop and accessories to W. E. Hazlett, of Mount Hope, in the same state; the company will devote its time to the handling of Overland cars and Goodyear tires.

The Cumberland Motor Co. has been formed in Nashville, Tenn., and will locate at 138-40 Third avenue, North, with the Abbott-Detroit, Little and Empire cars as its lines; John O. Cheek, formerly with the Cheek-Neal Coffee Co., is president, and William Dake, formerly with the Nashville Motor Car Co., is secretary and treasurer.

Under the style Spokane Motor Car Co., N. D. McIvor and A. O. Mueller have opened up in that Washington city at 1214 Second avenue. Repair work will constitute their first work; later they will take an automobile agency. McIvor formerly was manager of the Commercial Garage; Mueller was employed by the Northwest Auto Supply Co.

The Franklin Sales Co. is a new company organized in North Yakima, Wash., by John A. Nichols, Jr., president; George C. Arrowsmith, vice-president, and Thomas K. Robinson, secretary and treasurer; the company handles Franklin cars. Nichols formerly was superintendent of branches for the Franklin Automobile Co., of Syracuse, N. Y.

Felix Joswich, of the St. Paul (Minn.) Motor Vehicle Co., has purchased the Buick building on West 5th street, Minneapolis, from the Pence Automobile Co. and will hereafter handle the Buick business in the last named city; Joseph Gersten, manager of the Pence company, has not made public his plans; he may remain with the Joswich agency.

The Capital Auto Co. has been formed in Des Moines, Ia., to take over the retail distribution through Polk and nine adjoining counties of Maxwell, Columbia and Stoddard-Dayton cars, a business formerly handled by the United Motor Des Moines Co. A. G. Bigelow, who was former treasurer of the latter concern, is the moving spirit in the new company; the United Motor Des Moines Co. will continue the wholesale trade, and both concerns will have headquarters in the United Motor location at 1013-15 Walnut street.

A. W. Haile Motor Co. is the style of a new company which has taken over the Studebaker retail business in Buffalo, N. Y., and which also includes Erie and Niagara counties in its territory. A. W. Haile, the president and general manager, formerly was manager of the Studebaker retail branch in Buffalo, and the new company retains the old location at 1015-17 [illegible] street. Bradley H. Phillips, a Buffalo attorney, is secretary-treasurer. The Studebaker wholesale house in Buffalo is not affected by this change, remaining under the management of B. F. Kinsman.

Discovers New Fire Hazard in Garages

Because of the discovery, during a recent inspection of garages, of "an apparently new and serious hazard" in the form of a gasolene spraying machine for cleaning the oil and "gum" from motors and other parts, the Hudson Inspection Bureau has recommended to the insurance companies with which it serves that "a warranty be attached to policies to the effect that no cleaning of automobiles or automobile parts by the means of gasolene spray shall be done on the premises."

The offending machine is made of galvanized iron and resembles a 2½ gallon chemical extinguisher in appearance. It is provided with about 5 feet of ¼-inch rubber hose, a ⅛-inch nozzle, a pressure gauge and an air pump fastened to the tank. For cleaning purposes about two gallons of gasolene are placed in the tank and then an air pressure of from 50 to 150 pounds is pumped up. To clean the automobile parts from one to two gallons of gasolene under pressure are sprayed on the machine parts of the automobile to be cleaned. After a car has been sprayed, the gasolene is allowed to vaporize and the vapor to blow away before the machine is started.

Notwithstanding this supposed method of procedure, the insurance inspectors report that several fires have occurred due to premature starting of cars. At some garages this is done inside of the building and at others it is done in the street.

That this is an exceedingly hazardous process, they add, is evident when it is realized that every pint of gasolene vaporized will make 200 cubic feet of air explosive, and that this method of handling gasolene is especially conducive to rapid vaporization.

Recent Losses by Fire.

Rockford, Ill.—W. B. Taylor, garage and several cars destroyed. Loss, $20,000.

Paterson, N. J.—Robert White, [illegible] Houton street, garage and five cars destroyed. Loss, $10,000.

Carthage, S. D.—Carthage Garage, garage, nine cars, two motorcycles and a hearse destroyed. Loss unknown.

Boston, Mass.—Charles Jason, 20 Columbus avenue, automobile supply store damaged. Loss, $1,500.

Keyless Lock to Erect Castings Plant

The Keyless Lock Co., of Indianapolis, has let contracts for the erection of a plant at Hovey street and the Belt railway tracks in that city. The building will be a one-story structure costing $25,000 and will be utilized for the manufacture of brass and aluminum automobile castings.

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THE MOTOR WORLD

PUBLISHED EVERY THURSDAY BY

ıe Motor World Publishing Company
) BROADWAY NEW YORK, N. Y.

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F. V. CLARK, Business Manager.

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IAXTON R. DAVIES J. FRANK GILMORE

cription, Per Annum (Postage Paid) $2.00
e Copies (Postage Paid) . . . . . 10 Cents
ign and Canadian Subscriptions $3.00
Invariably in Advance.

ostage Stamps will be accepted in payment for subscriptions. Checks, Drafts Money Orders should be made payable to The Motor World Publishing Co.

hange of advertisements is not guaranteed unless copy therefor is in hand ATURDAY preceding the date of publication.

ontributions concerning any subject of automobile interest are invited and, ceptable, will be paid for; or, if unavailable, will be returned provided they iccompanied by return postage.

Cable Address, "MOTORWORLD," NEW YORK

red as second-class matter at the New York Post Office, November, 1900.

NEW YORK, SEPTEMBER 12, 1912.

THE MOTOR WORLD AND THE PRESS AGENT.

Usually, the press agent is a good fellow and an uncommonly clever one. It is his business to make mountains out of molehills—to make pinholes appear blow-outs, and, generally speaking, he performs his work so ingeniously that many men are induced to believe that sort to be good advertising, which, figured at space rates, is worth something less than $1,000,000 and 4/100ths cents per year, and that publications which do not print such proof of cleverness are indifferent or inappreciative mediums. But—the Motor World is not being conducted for the benefit of press agents or for the exploitation of their talents.

CAR BODIES FOR THE TWO POWERS.

Whether it is due to familiarity which breeds indifference or ıdness to defects, or to the existence of genuine beauty of out-, it is unquestionable that the prevailing type of gasolene tor car body is considered decidedly handsome. Nevertheless, s true that it is not so much the outcome of choice as of neces-, for engineers have decided that the chassis as now built is it should be and as it must be, and the body necessarily is ıpted to the chassis, which leaves little or no choice except in tters of detail.

That genuine admiration exists for the gas car type of body is made quite clear by the fact that not a few electric cars are so closely modeled after the gas car type that it is difficult, if not impossible, to distinguish between them at a distance. And this despite the fact that in the case of the electric there are so few limiting conditions that the body can be given almost any desired form, and there is no restriction on the positioning of the seats. It seems curious, to say the least, that the gas car body, evolved under close restrictions and conforming to unalterable conditions, should prove more popular than a body worked out practically without conditions or limitations of any kind. Such, however, seems to be the case.

It would appear quite reasonable to expect that, with the artistic talent and the designing ability that undoubtedly exists in this country, together with the general appreciation of any new thing that really possesses merit, something quite different from the gas car body would be developed for the electric—something that would be as typical of the electric car as the gas car body is of the gas car. The earlier electric cars were modeled closely after horse-drawn vehicles of popular styles, and for some time this was necessary, because it was the only style that was known, and it requires time to set up a new standard of beauty. This restriction long ago ceased to exist; despite this fact, however, electric cars have either adhered more or less to horse vehicle types or else have adopted gas car forms. While there undoubtedly are many handsome bodies that are in no way reminiscent of the horse and that bear none of the ear-marks of the gasolene motor, they have not attained the same proportion of popularity that the gas car body has in its field. It would seem, therefore, that there is a promising opportunity for a designer of originality who can put his ideas into a form that will meet with popular approval. At the present time there exists no generally accepted style for electric car bodies, and it is "up to" someone to take advantage of the absence of restrictions and the magnitude of the field and create one.

OPPORTUNITIES OFFERED BY ACCESSORIES.

Whether men actually engaged in the automobile business ultimately will control the retail sale of accessories is one of the pretty questions which grows larger with the days. Department stores long since realized the opportunities afforded, and during the last two years hardware dealers also have recognized that the sale of automobile accessories fits well into their general business scheme, and so gradually almost as not to be noticed, they have become factors which accessory manufacturers can no longer afford to overlook.

By all the laws of logic, however, the sale of such wares properly belongs to the automobile dealer and the garageman and, as the Motor World many times has remarked, the wonder is that so many of them refuse to recognize the broad truth that faces them. An accessory department or an accessory counter rightfully should constitute a part of every automobile salesroom and of practically every garage in the country. Their customers are the buyers of such wares, and to permit these customers to go elsewhere for such goods is in the nature of deliberately turning away business and constitutes an offense to commercial acumen.

It is high time that the automobile dealer and garageman cease complaining of their lots and make the most of an opportunity for the improvement of their business which long and persistently has presented itself to them.

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"STANDARD OIL" IN CARBURETTERS

Big Corporation's Engineers Seeking to Evolve Device to Utilize Kerosene—Relief That Would Be Afforded.

While the Standard Oil Co. has sat tight and said nothing while engaged in the interesting pastime of increasing the price of gasolene from nine to 16 cents in the course of six months, it has not been wholly idle in other directions. While official sources will admit nothing, it is known positively that the big oil company has set certain of its engnieers to the mighty task of evolving the long-sought and much-invented kerosene carburetter. Progress has been made in that direction, but whether it is sufficient to justify the hope that a Standard Oil carburetter will make its appearance in the near future cannot be learned. The mere possibility, however, that such a device from such a source is possible is of momentous interest.

Kerosene, as is quite generally known, is almost a drug on the market, even at 11¼ cents per gallon, and it long has been apparent that the development of a carburetter that will permit its general use will relieve the situation which latterly has caused such great embarrassment, to say nothing of reducing greatly the fire hazard and the cost of operating motor vehicles of all kinds.

About a year ago the story found its way into print that the Standard Oil Co. had offered, or purposed offering, a prize of $20,000 for a practical kerosene carburetter, but the Motor World's inquiry at the company's headquarters in New York promptly put the story to rout. It was denied in toto, but the Standard Oil mouthpiece added agreeably that, although the big company was offering no prize of the sort, nothing would please it more than for some one else to offer such an inventive stimulus.

Electric Men Form Association.

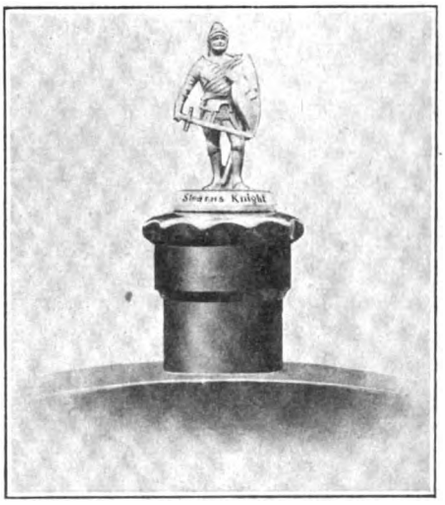
Co-operation among electric vehicle interests in New York City is planned through an organization which was formed Thursday last, 5th inst., and which bears the name New York Electric Vehicle Association; the organization comprises manufacturers and sellers of electric vehicles and the operators of power stations which supply current for the charging of batteries, and it is designed to get behind the electric business in New York City and give it the substantial push which, the electric men, say, is what is needed to make the gasolene vehicle, especially trucks, loom very much smaller.

The association has not yet chosen its officers, but has opened temporary headquarters in the New York Edison Co.'s building at 124 West 42d street, where Harvey Robinson, the head of the Electric Vehicle Association of America, is in charge; Robinson is admirably situated for the work, as he is at the head of the Edison company's automobile bureau and is accessible to the men interested and is familiar with the situation.

There is no intention of permitting the new association to interfere with the work of the national organization, since the province of the former is essentially New York City. Among plans under consideration are the establishment of a centrally located, common showroom equipped with model charging facilities and the maintenance of a list of reliable garages within the city. A permanent paid secretary probably will be employed, who will devote his entire time to association work and who will consult with and advise members of the association when occasion demands.

Stearns Cars Now Truly "Knighted."

Replacing the white line radiator as the distinguishing ear-mark of the Stearns car,



and standing out as distinctly, a new trade mark has been adopted by the F. B. Stearns Co. It consists of a 3½-inch metal reproduction of an armored knight, fastened to the raditor cap of all Stearns-Knight cars. The words "Stearns-Knight" are placed on the pedestal on which the figure of the knight stands, and the emblem as a whole serves to distinguish the car at a glance. The trade mark has been copyrighted.

R. C. H. Line Now Embraces the Coupe.

The approach of the open season for closed cars, so to speak, is the appropriate time chosen by the R. C. H. Corporation, of Detroit, to offer a new coupe model built on the regular 110-inch wheelbase touring car chassis. The interior of the car, which is built for three passengers, is upholstered in dark gray whipcord, with silk window shades to match. The equipment includes five electric lights with 100-ampere hour battery, speedometer, an extra demountable rim, locking tire holder and a trunk with slip cover. The trunk and the 26-gallon gasolene tank are mounted on the rear deck. For warm weather use the car can be thrown open all round.



September 13, Sandusky, Ohio.—Track races promoted by E. A. Moross.

September 14-21, Chicago, Ill.—Chicago Automobile Trade Association's fall festival.

September 16-21, Detroit, Mich.—Automobile show in the Automobile Building at the State Fair grounds under the auspices of the Michigan State Fair Association.

September 17, Milwaukee, Wis.—Grand Prize road race under the auspices of the Milwaukee Automobile Dealers' Association.

September 21, Milwaukee, Wis.—Vanderbilt Cup race on the Wauwatosa course under the auspices of the Milwaukee Automobile Dealers' Association.

September 21, Detroit, Mich.—Track races under the auspices of the Michigan State Agricultural Society.

October 4-5, Sioux City, Ia.—Track races under the auspices of the Sioux City Automobile Club.

October 7, Detroit, Mich.—Start of the National Reliability tour to New Orleans for the Glidden, Anderson and National trophies.

October 7-11, Chicago, Ill.—Chicago Motor Club's reliability run.

October 7-12, St. Louis, Mo.—Outdoor show in Forest Highlands Park under the auspices of the St. Louis Automobile Manufacturers and Dealers' Association.

Dates Set For Sales Managers' Meeting.

Monday, September 30th, and Tuesday, October 1st, finally have been set as the dates for the Automobile Board of Trade's sales managers' conference, which has been hanging fire since it first was proposed in the early summer. The meeting will be held in the New York offices of the organization and will be directed by its trade committee, of which H. O. Smith (Premier) is chairman. He already has a tentative program well mapped out.

Rutenber to Form a New Company.

E. A. Rutenber, who designed the well-known gasolene engine which bears his name, has retired from the Rutenber Motor Co., which some two months since acquired the Western Motor Co. of Logansport and Marion, Ind. He has in view the formation of a new company in Logansport, which also will bear his name and which, of course, will manufacture gasolene engines for use on vehicles.

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THE ZACHARIAS WAY OF CONDUCTING A GARAGE

Progressive Methods Brought to Bear by a New Jersey Veteran Who Mixes Brains with Business—Big Leaks Stopped By Wire Netting and a Horse—Garage Rates With and Without Service and Why the "Without" Tariff Is Favored.

His belief that dealers are the "goats" f the trade and, being "goats," should be illy goats and use their horns on the anufacturers to better their condition—ays of doing which he outlined in the lotor World of August 29th—is not the nly thing which has occupied the mind of . R. Zacharias, president of the Zacharias arage Co. of Asbury Park, N. J.

Trusting to luck and crying over spilled ilk play no part in the Zacharias policy hich has led to such a measure of success ; to cause Zacharias to stand out from his llows. He is a thinker, and evidences of is thoughtfulness are apparent in every partment of his large establishment, hich has a capacity for all of 180 cars id which includes not merely the storage id washing of cars but the sale and re-ir of them and the sale also of acces-ries.

Evidence of Zacharias's business acumen plain to all who travel the roads leading Asbury Park. For many miles and in any directions, Zacharias mile posts in-rm the wayfarer of the distance to or om Asbury Park and, incidentally, of e Zacharias garage. The big Z which aracterizes them is so plain and they are frequent that all must see.

Being a seaside resort, Asbury Park and e roads thereto are much visited by tour-s, and reaching the Zacharias establish-nt itself the visitor there finds detailed ad maps of the surrounding country, all pocket size, which are to be had for the king, or without the asking, for that tter. As a matter of course, they bear e Zacharias imprint.

If the tourist happens to be in the trade, to stand well with the Zacharias princi-pals, a Zacharias "pass" probably will be tendered him. It entitles him to free stor-age and, as is shown by the reverse of the "pass" which is here reproduced, the cour-tesy is designed to strengthen friendship and promote interchange of ideas. Like as not the visitor, who in all probability is in need of gasolene, will discover that the enterprising Zacharias has felt the effects of the skyrocket increase in the price of fuel and has taken means to soften the pos-sible wrath of the purchaser. The means takes the form of a "Don't Scold" placard, which also is here reproduced, and which places the blame where it belongs.

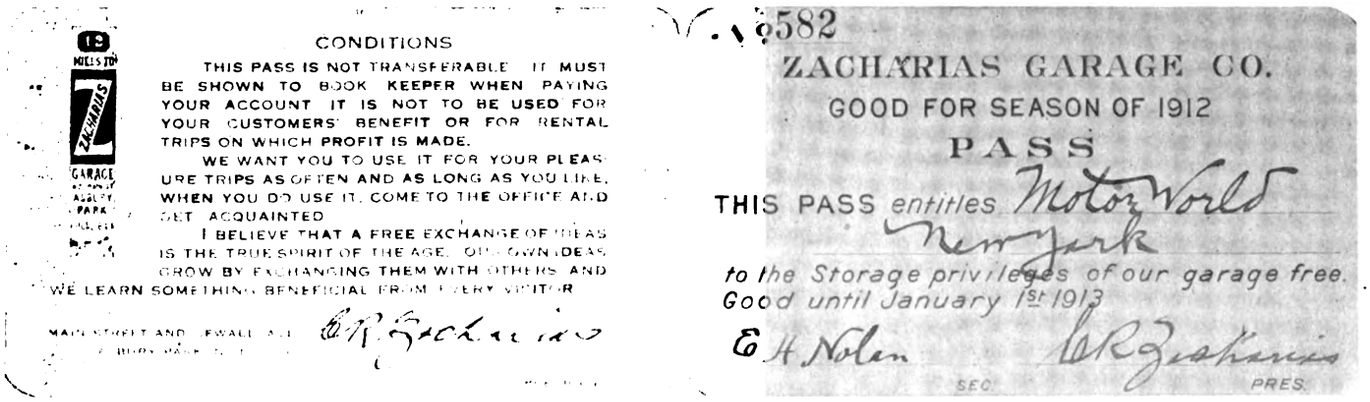
If he remains over night in Asbury Park, the visitor will discover that the Zacharias garage is provided with bins wherein he may store such luggage or paraphernalia as he does not desire to carry to the hotel or to leave in his car, where it so easily can be found by those who are given to such seeking.

If the visitor is in the trade and, there-fore, interested in such things, and is seek-ing that exchange of ideas which the Zacharias "pass" invites, he is more than likely to discover that he will receive more ideas of a helpful sort from Zacharias him-self that he is likely to find in one place in a month's travel. The Asbury Park dealer is free with his ideas, and though they are many and valuable, he speaks of them neither loudly nor boastfully, but none the less earnestly. He is one of the men who is intent on improving the tone and the methods in vogue in his chosen calling.

It does not require extended conversation with him to discover that he realizes to the full that time is money, and time-saving methods and time-saving apparatus are ap-parent on all sides. "Stopping leaks" is what he now describes as his principal oc-cupation, and already he has stopped not a few of them and, strange to say, the larg-est leak has been stopped by the use of a horse; for a horse plays an important part in the operation of the Zacharias garage. Zacharias estimates that the saving from this source alone amounts to $1,200 a year.

Whenever his employment of a horse is mentioned its use seems so incongruous that it rarely fails to provoke a more or less derisive or cynical smile on the faces of those who never have witnessed the part which the animal plays. It performs its work during the night hours when the cars are washed and polished. The garage is a big one-story structure, which covers the larger part of a city block, and is devoid of flooring of any sort, the use of the ani-mal thereby being rendered more easily feasible than would be the case in an establishment of smaller dimensions or many stories.

"Under the old order of things," said Zacharias, in recounting the influences that led him to employ animal power in his garage, "I found that when it was neces-sary to move a car to or from the washing platform, four, five, six or even eight men would drop their work to lend a hand in pushing it from one place to the other, the pushing operations entailing 10 or 15 min-utes. When I figured the cost of six or eight men at 20 cents per hour, I soon saw that there was a leak to be plugged and sought a means of doing it. On the advice of an engineer, we first rigged up an elec-tric winch. It served the purpose, but was more or less in the way and had to be



ZACHARIAS "PASS" THAT INDICATES COURTESY AND PROMOTES ACQUAINTANCESHIP

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abandoned. I did not despair, however, and discussed the subject so often with my foreman that once in exasperation he exclaimed, 'What you need is a jackass.' That gave me the idea; I hired a jackass. The ass was an improvement on the electric winch, and I began to save money, but the animal was too light for the heavier cars and, accordingly, I resorted to the horse and, as I have said, I since have saved in the neighborhood of $1,200 each year. Instead of six or eight men spending 10 or 15 minutes pushing a car, but two men are required, one to drive the car and the other to drive the horse, and they perform the same work in about one minute. I have held a stop watch on them many times."

When not employed the horse stands hitched to a post convenient to the washing platform, and immediately its services are required a hook, which forms a part of his harness, is attached to the rear axle of the car which is on the platform or off it almost in Jack Robinson time.

Among other things, the Zacharias establishment is characterized by separate entrances and exits, and as a further example of the thought that he has bestowed in the effort to save time and facilitate service is the recent installment of an indoor gasolene pump, which operates three or four times as rapidly as the pumps in general use, one of which also is maintained in front of the Asbury Park garage for the use of those who have no objections to filling their tanks out of doors and to whom time is no object. Not a few people, Zacharias has found, object to outdoor replenishment of their fuel.

Talking of other "leaks" which he had stopped, Zacharias cited soap and waste as two examples.

"For a long while we used soft soap," he said, "the waste of which is prodigious. We tried all sorts of schemes to reduce it, and finally hit upon hard soap, which has proved the solution. The soap people are not anxious to sell the hard stuff, but we insist that we will have no other and we get it. The loss through cotton waste also constitutes no small item. It sounds small, I know, to refuse a chauffeur the handful which he asks, but hundreds or thousands of such handfuls in the course of a season amount to a pretty sum. At first we gave it away; now we sell it in small bags.

"When I was young in the business," went on Zacharias, I was told that it was the proper thing to furnish rubber boots to the washers. I furnished them, only to discover that many times when the washers took their departure the boots went with them. Now we pay the washers a straight salary and they furnish their own boots."

Leading the way to his stock room, Zacharias indicated for the Motor World man the heavy wire netting which apparently protected the doors and windows which open into an alley.

"There's another thing that stopped a big leak," he remarked, as he pointed to the netting. "All of one season's profit on the sale of more than $25,000 worth of tires and $500 in addition went through that door and those windows," he vouchsafed. "or, at any rate, I never was able to account otherwise for the loss, and I know that after the netting was put in place the big leak stopped."

Zacharias has some very positive ideas on garage policies and garage prices. While competition has forced them to name a flat rate per month for storage and service, which includes washing and polishing, he frankly admits that he greatly prefers to dispense with the washing and polishing operations, or to make a separate charge therefor. In fact, he has a schedule of rates in which this idea is brought to bear. It is as follows:

	Without Service — Per week	Per night
Motorcycles	$1.00	$0.25
Runabouts	2.50	.75
Small Tonneaus	3.75	1.00
Touring Cars	5.00	1.50

Washing, 50c.; Polishing, 50c. up.

These figures apply during the months of July and August, when the seashore resort season is at its height. During this period, on Saturdays and Sundays particularly, it is not uncommon for the Zacharias establishment to handle more than 150 cars a night. At that time he employs about 75 persons, including his office force. During the off season he pays wages to about 30 people.

His flat rates are $20, $30 and $40 per month with service, or just half of those amounts without it, and, as stated, he much prefers the "without" system.

"In New York, I understand, it costs about 60 cents to wash and polish a car," he said in discussing that subject. "Down here, during the height of the season, at any rate, it costs us about 70 cents, and as every owner who pays a flat rate for service expects that it will be rendered every night, whether or not his car requires it, it does not need much figuring to discover that washing and polishing usually is conducted at a loss. I am not certain that it would not be a good idea for garagemen everywhere to institute a 'with' and 'without' schedule and endeavor to convince owners that their cars would be better off if they were washed less often, and that they themselves probably will save money if they pay for such service only when it is rendered. In this salt-laden climate, and with the water we have to use, I am not sure that too much washing does not actually hurt cars. At any rate, I do not favor a flat rate per month and avoid it whenever possible. So far as limousines are concerned, I honestly much prefer not to handle them at any price. There is no profit in washing and polishing them, even at $40 per month. I have known our men to spend as much as five hours in restoring one of them to a presentable appearance."

Asked what department of his business was most profitable, Zacharias instantly responded: "The sale of gasolene, and that is not as profitable as it used to be when lower prices prevailed." He disposes of about 60,000 gallons per year, buying the fuel in tank car lots and storing it in a 10,000 gallon tank which has been built under his garage.

"Yes, I do a good business in the sale of accessories," he admitted, "but the discounts are small and we have protection on mighty few articles. The Klaxon horn is one of the few exceptions to the rule. We can make a living profit from its sale and we are protected."

DON'T SCOLD!

OUR PROFITS ON GASOLINE

are less today at 20 Cents than last Season at 15 Cents

You pay the difference to the Standard Oil Company — Not to Us

ZACHARIAS Garage Co.

ZACHARIAS PLACARD THAT MEETS AN EXISTING SITUATION

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CIVILITY—A VALUABLE ASSET THAT COSTS NOTHING

First Impressions Gained by Dealer's Customers Often Are Stepping-stones to Consummation of Sale—Being Pleasant to Everyone Insures Goodwill that Pays Handsome Dividends—Prompt Attention to Callers Should be a Cardinal Virtue.

As the Sales Manager entered the door of Reilly's salesrooms, the former was but a few feet in advance of an aged, grimy son of toil who, as a prospect for an automobile dealer to work upon, looked anything but promising; and yet, as Reilly released the Sales Manager's hand, which he had warmly grasped in greeting, and turned to the newcomer the dealer's welcome was far from chilling—in fact, it was even more agreeable than the greeting he had extended to the Sales Manager.

"Just a minute, Jim, until I see of what service I can be to this gentleman," said Reilly, as he relinquished the Sales Manager's grip and stepped to meet the workingman.

"Good mornin'," said the stranger. "I wuz wonderin' would yez do me the favor of tellin' me how to git to Maple street."

"I sure will," was Reilly's pleasant answer. "You go four blocks straight ahead down this street, then turn to your left, go two blocks and you will find Maple street one block to your right."

"I thank yez ivver so much, mister; I am much obliged to yez. 'Tis not ivery wan would be bothered with an old man like meself."

"O, you're entirely welcome; it's a pleasure to direct a stranger," answered Reilly. "It's a warm morning; won't you rest a while?"

"No, thanks, I'll be goin', and good luck to yez."

"The same to you," was the dealer's cheery answer, as he saw the old man started in the right direction.

"Well, Jim, how's things?" he said, turning again to the Sales Manager. The latter, however, feigned a grouch and, without replying, began to stroll about the salesroom, displaying a forced interest in the cars upon the floor.

"That's right," said Reilly, "circulate around. Do you think you're a part of the ventilating system, or what? What's the matter with you?"

"I'm 'sore'," was the answer.

"At what?"

"Well, if you must know, here I come all the way down from the factory to see you, and the minute I get in the door you drop me as if I was a leper and devote your time to a greasy old workman who may be a professional panhandler for all I know."

"Is that all that ails you?" queried Reilly.

"Isn't that enough?"

"It may be more than enough," was the dealer's answer, "for if another one just like him, or even worse, comes in he gets the same kind of treatment; see? Get mad if you want to. I can't help it." And from the inflection of each succeeding word the Sales Manager saw he was on the way to roiling Reilly. But the object of the grouch having been accomplished, the Sales Manager consented to be sociable again.

"Got a glad hand for everyone, have you?" asked the Sales Manager.

"That's what I have," answered the dealer.

"What good does it do?" was the visitor's interrogation. "A man like that never would buy a car."

"You're probably right, but this pleasantness, even if it is often forced, is a part of the business. It's a part of the instructions I gave myself in a little business correspondence course I mapped out for my own use."

"Does its application so broadly help any?"

"I think it does, although I don't know; but I'm taking no chances. It certainly does no harm. The lack of it lost me one sale once upon a time and it never will lose me another. Being civil and even a little more than civil is not a bad attitude when dealing with the public. So long as I am getting my living from the public, it is up to me to be as well thought of as possible.

"When I first started in business I felt rather important in a way, because it was the first time I ever had been the head of a business with my name on the letterheads and over the door, and any young fellow is likely to get a bump. I'm afraid I wasn't very agreeable to rough looking old fellows like the one who was just in here. If he had happened in several years ago I probably would have asked him what he wanted and would not have been any too sweet about it either, and he would have got just the reception you can see from his remarks he expected to get when he came in.

"But I was shown the folly of it. One day a somewhat elderly man, none too well dressed, shuffled in the door and I was just a little gruff as I said, 'What do you want?' 'I want to see Mr. Reilly,' he said. 'Well, I'm Mr. Reilly,' I answered, 'what do you want?' The old man looked me over rather critically, hesitated a moment, and then said, 'I don't believe I want anything.' He walked out, and I didn't think any more about it until a couple of weeks later when I saw him drive by one day in a new car—and the car wasn't one of mine. As the old man passed he smiled pleasantly and said 'Good afternoon, Mr. Reilly.' I was too dumbfounded to say a word, for the old man wore a rather knowing smile. I found out later that he was a well-to-do but eccentric old codger who lived on the other side of the town and that he had been in the market for a car. Someone sent him to me, but he never got any further than the salesroom door; he bought his car a little further down the street.

"If you could have heard the things I called myself you would have shuddered to think such language existed, and right then and there I said, 'Reilly, you're a fool—a foolish fool; hereafter you come down from your high horse and act civilly. If a lame dog limps in you are going to tell Mr. Dog how tickled you are to see him; you're going to try to shake hands with him and you're going to sympathize with him and ask him how he hurt his foot; and if you stumble over a drunk in the gutter some night you're going to take off your hat, beg his pardon and ask him if there is anything you can do for him. If he'd rather have another drink than be taken home, go get him a drink. Neither the drunk nor the dog may buy a car of you, but it's good practice—and what you need is practice in acting human.' The things I said to myself made me sore, but I was due for the calling and I swallowed it. That minute I started in to make civility an asset. It doesn't cost anything and it is priceless.

"You don't know what a fine disposition I worked up just by forcing myself to be pleasant; the first thing I knew I was one of the pleasantest men in town and was getting so I enjoyed it. I made it a rule to make no exceptions but to be very pleasant and civil with everyone, even with the kids that come in here and bother me with fool questions about cars. Being pleasant with people I ordinarily would not care to be even civil to is great practice and it makes me doubly agreeable with people I really am glad to see. Of course, I never expect any of these rough-shod shovel handlers like the old man we just saw to turn into a prospect with gold lined pockets, but warming up to him is just a part of the lesson of being polite to everyone. That way you're always sure to be agreeable to the people who are real prospects; at that, you never can tell a prospect these days from his looks.

"Take, for instance, the man who comes

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in to buy a car—or rather the man who is in the market for a car and who comes in to look over your line. If he is a man whose mind is not made up and is also a man who appreciates being pleasantly handled he is just as likely as not to be as much impressed by the dealer as by the car and to make his purchase accordingly. Very often a salesman will become weary with a prospect and will make some kind of an unintentional but nevertheless rude remark, and these few words are likely to means the loss of a commission amounting to $400 or $500.

"Also, you will notice, I went forward to meet the man as soon as I got my eye on him—of course, however, letting him get inside first, for making a mad rush at him would make me appear too eager to get at him. This, I wish to say, is one of the important points in my civility lessons. I used to make the mistake of letting people come in and wander all around the floor for several minutes before I went to greet them; if I happened to think I was busy at something else I might let them stroll around for five or ten minutes.

"My wife's sister never liked our line of cars for some reason or other, and when she was ready to buy one started out to shop along 'automobile row.' But she finally gave it up as a bad job and decided to buy inside the family. She got sore at some of the other dealers and refused to go to see any more of the cars. She is used to having some attention paid to her, and when she went into one salesroom she strolled around for several minutes, looking at what cars were on the floor, while the manager of the place sat in his office signing letters. Finally he decided he would favor her with his presence, but all he said as he approached her was 'I'm sorry, madam, but our new models aren't in yet.' He didn't even endeavor to find out whether she wanted a new car or a second-hand car, and he never tried to tell her anything about the advantages of the new models and didn't extend an invitation to call later to inspect them. If he had been on the job he would have got her name and address and would have made arrangements to call around and give her a demonstration when the new cars came. Nothing impresses a woman prospect like this kind of attention and, knowing my sister-in-law as I do, I am willing to bet that, had he warmed up a little and followed her up, he would have landed the sale. But, no! She went out rather 'hot' and made up her mind she never would buy one of those cars, anyway.

"She went to another dealer whose line she had considered, and as she walked onto the floor a salesman sat tipped back in a chair reading a newspaper. When he finished the story he was interested in he strolled across the floor, but before he got to her she was on her way to the door. That ended her shopping trip, and when she went to my wife a few days later to tell her troubles my wife, who is not such a bad salesman as you might think, wound up by selling her a car.

"If you let a man come in and wander around he is likely to change his mind inside of five minutes, and it doesn't require much to start a human mind changing; they are peculiar things. The best way to handle a man is to meet him before he has had time to do much toward forming an opinion and let your personality and salesmanship be on the job from the very start of that opinion. I never could understand why dealers who have been in business for years will slight these opportunities. These same men will go into a clothing or shoe store and will remark upon the civility and promptness of the clerks, but they never seem to realize that the same methods could be made to apply to the automobile business. There is no better example than the United Cigar Stores; their clerks, of course those are their orders, are right on the job every minute and politeness and promptness is a part of every minute's work. What it amounts to can be seen by noticing what the United Cigar Stores Company amounts to.

"A reputation for being a 'nice man to meet' will spread. I know that my owners often remark to friends that even if they do have a little trouble with the cars now and then they do not mind, because they get good treatment every time they come in the shop. I have instilled some of these things into my help. The office girl has acquired one of those gentle 'telephone voices' and even the repairmen are in a fair way to becoming Chesterfieldians. I am thinking seriously of——"

"Try it on this one," said the Sales Manager, as he indicated a bronze-visaged son of Italy who was bearing down upon the front door at high speed.

"How do you do?" greeted Reilly.

"How I do nothing! How you do yourself? I fix-a you, you bigga bum! You bigga loaf'! I gotta my lawyer after you He fix-a you. You think-a you bigga man, you ride-a in-a da automobile, you drive-a by my little-a girl, you throw-a da mud all on-a her clothes. I make-a you pay! I fix-a you!"

"I——" began Reilly.

"I-a nothing! I fix-a you! You think-a me 'fraid you 'cause-a you gotta da car. S-a-c-r-a-m-e-n-t'! C-a-r-a-m-h-a! — ! — ? X — Z——" and with no cessation in his tirade, which had degenerated into unintelligible Italian, the indignant Calabrian darted out the door and dashed down the street, each instant becoming mentally more calorific.

Reilly, who still stood open-mouthed, turned to where the Sales Manager was rocking in his chair, vainly endeavoring by pressure of both hands upon his belt buckle to ameliorate the pain of laughter. "Why didn't you try it on him? Why didn't you try it on him?" almost shrieked the Sales Manager, as he again resumed his uproarious mirth. "Maybe he would have cooled down a little."

"Whew!" ejaculated Reilly. "Try what?" "Civility, politeness, being agreeable, your whole scheme."

Reilly sought a retort and, finding none, snapped, "Aw shut up!"

Repairing the Worn Friction Disk.

With cars of the friction driven variety wear will in time cause "dishing" of the friction disk, and since the greatest amount of wear occurs at the outer edge, which represents high gear, it is but natural that the unevenness of the disk will prevent the friction from getting a good hold under any kind of a load. A repair is easily effected by resurfacing the disk with a disk of steel, an old circular saw blade, for instance, care being taken to make provision for the unevenness of the original disk by applying a ring of fiber or leather around the outer edge. The steel should be bolted to the driving disk and the heads of the bolts countersunk so that they will not tear the fiber rim from the friction wheel.

Lubricating Oil to Detect Fuel Leaks.

Detecting small leaks in the fuel line is no simple matter, for the gasolene evaporates as soon as it touches the air, so that unless the hole is large enough to permit of the escape of a considerable quantity of fuel at a time, leaks generally pass unnoticed. If a small quantity of lubricating oil is mixed with the fuel, however, the location of small leaks is a comparatively simple matter, for the oil will not evaporate as does the gasolene and is noticeable on the metallic surfaces.

Turning a Tightly Set Screw.

If a screw is so tightly set that it cannot be loosened by the ordinary application of a screwdriver, insert the end of a cold-chisel in the slot and turn slightly in the direction to unscrew the screw. A sharp blow struck squarely on the end of the chisel will cause it to bottom in the slot, but the inertia of the chisel acting to prevent its turning to its original position will cause the screw to turn slightly. A few repetitions of the treatment will loosen the screw sufficiently for the use of the screwdriver.

Another Way of Securing Hammer Heads.

One of the eleven million different ways there are of keeping a hammer head from coming off is to drive a piece of very stout wire through the shaft about half the length of the head from the end, turn up the ends, letting the wire lie in grooves cut for the purpose, slip on the hammer head and then turn the ends of the wires outward on the top of the head, one on each side of the hole.

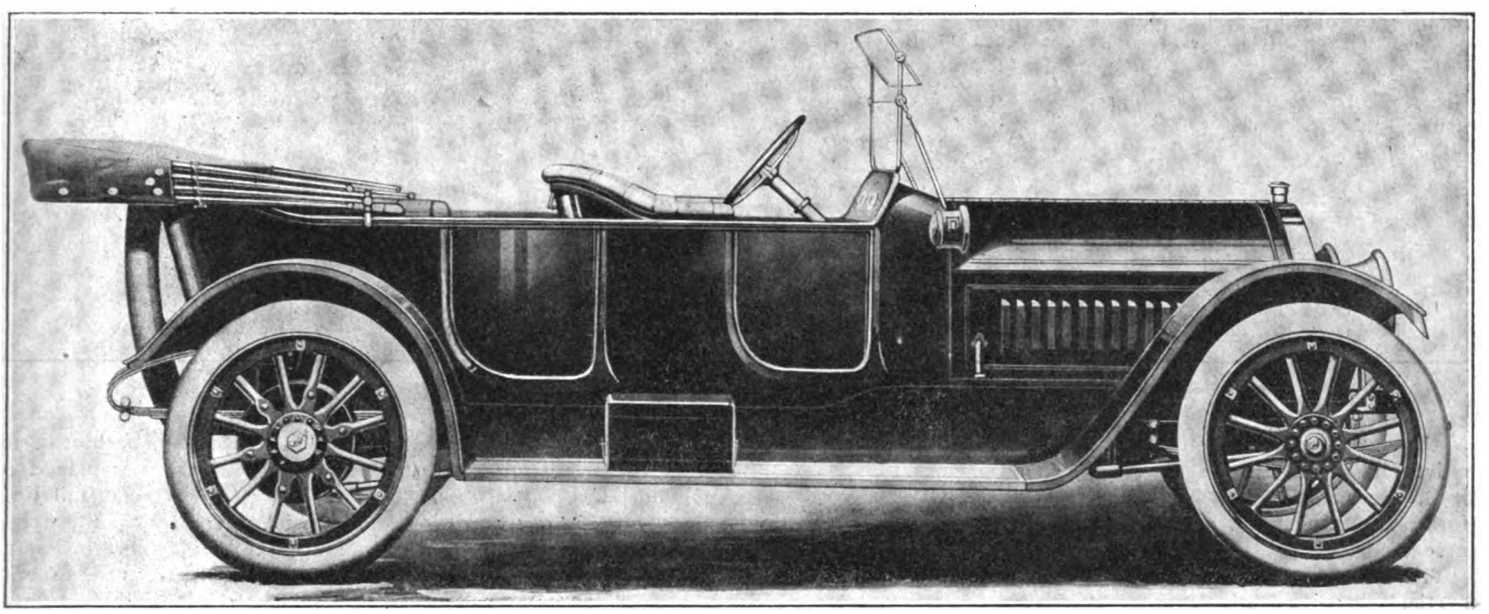
Improving the Air Valve Facing.

A little dry graphite rubbed into the leather facing of an air valve improves its seating and lengthens the life of the leather. It should be rubbed in quite hard and all the surplus powder brushed off.

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BIG "SIX" AND LITTLE "FOUR" IN COLE LINE

New Series Consists of Three Chassis Instead of One, All Fitted with Electric Motor Starters—All Chassis Built on Same Lines, but with Motors of Different Ratings—Gravity Gasolene Feed Abandoned in Favor of Pressure Feed Tank in Rear of Chassis.

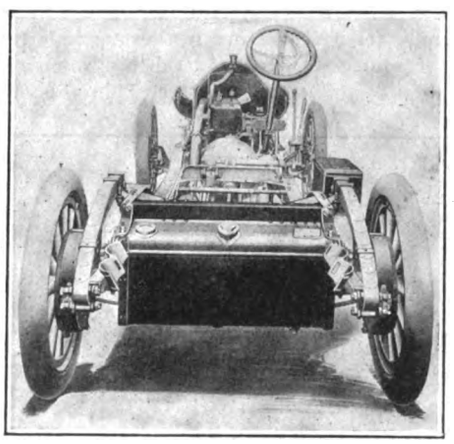


COLE 60 HORSEPOWER "SIX," LEADER OF THE NEW SERIES EIGHT, SHOWING COWL-BOARD FOR INSTRUMENTS

Having abandoned the "yearly model" policy some time since and adopted the series plan, Cole cars of the eighth series now are being presented by the Cole Motor Car Co., of Indianapolis, Ind.

While there are a number of differences between series eight and the preceding series seven, the changes are chiefly in the form of additions, to perpetrate a bull. Series seven consisted of a number of different bodies, all of which were mounted on the same chassis. Series eight, however, consists of three chassis, one larger and one smaller than the former model, while the medium size car is retained with only a few changes. All models are equipped regularly with the Delco motor starting and car lighting and ignition system, and in all cases gasolene is fed to the carburetter by pressure; the gravity feed system has been abandoned and air pressure substituted, the tanks being hung in the rear. These features are common to all three chassis, which are styled the "40," the "50," and the "60."

The largest of the new models, the "60," is a six-cylinder car with a wheelbase of 132 inches and a motor having cylinders of 4⅛ inches bore and 4¾ inches stroke, cast in pairs. The valves, which are all on one side, are completely enclosed, giving the motor an extremely neat and clean appearance and assisting in noise elimination. The power plant is of the unit type, of extremely neat design, with the Delco motor-generator on the right side driving through teeth cut in the rim of the semi-steel flywheel; it is hung on a three-point suspension, as in former models. Other features that have been incorporated in the "six"



NEW COLE GASOLENE TANK

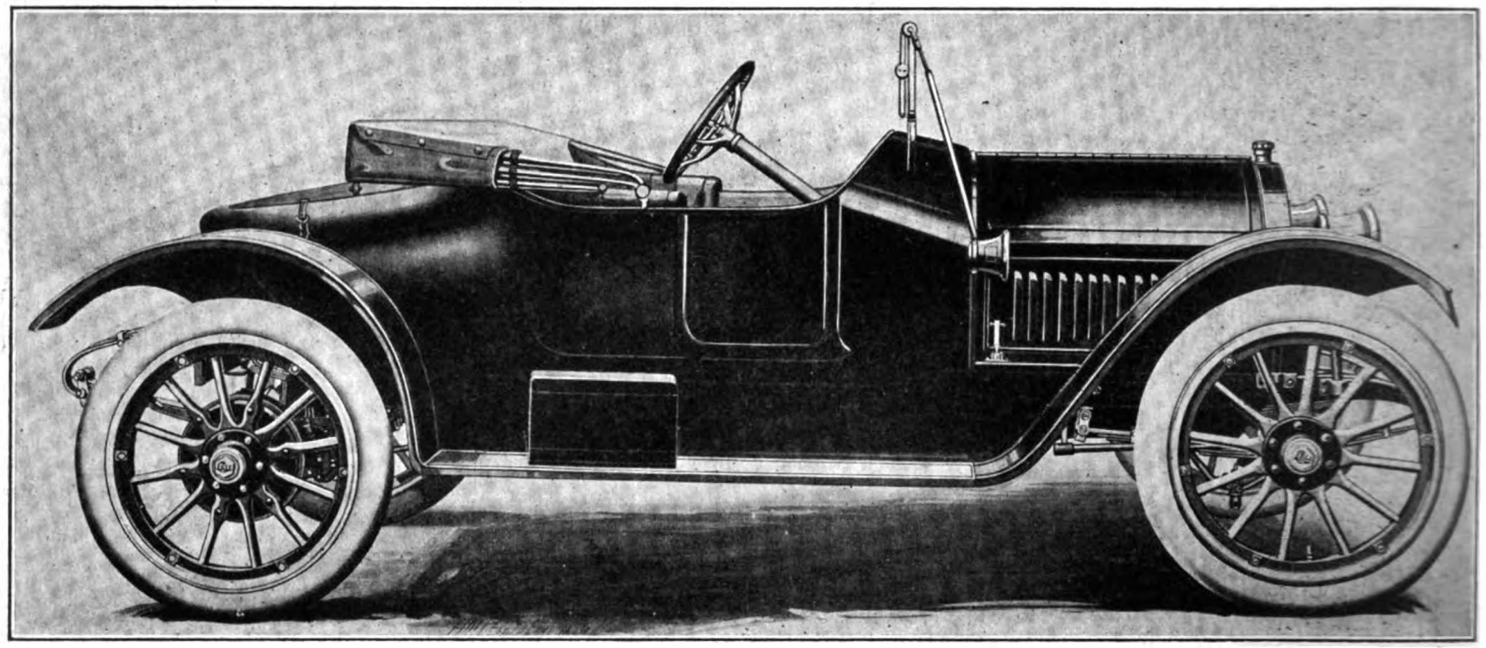
and which were characteristic also of the former Cole cars are the full-floating rear axle running on roller bearings, the roller bearing front axle, leather-faced cone clutch, irreversible steering gear with 1¼-inch post and 18-inch corrugated rim wheel and aluminum spider, double torsion rods, three-speed gearset and other details.

A change from previous practice which is embodied not only in the "six" but in the two smaller models as well, consists in dropping the frame, from a point just back of the motor, two inches; the rear of the frame is of the "kick-up" design, which gives ample play to the springs, notwithstanding the low hanging of the car.

Apart from the dimensions, the power and number of cylinders of the motors, there is practically no difference between the three models; they are built on the same lines, preserving the same proportions and embodying the same mechanical features. The smallest car, the "40," has a four-cylinder motor of 4½ inches bore and 4¾ inches stroke and a wheelbase of 116 inches, 36-inch wheels and 4-inch tires. The medium car, the "50," which, as already has been stated, is but little different from its predecessor in series seven, has cylinders of 4½ inches bore and 5¼ inches stroke, a wheelbase of 122 inches and 36-inch wheels with 4-inch tires. The "40" has brake drums 14 inches in diameter and 2 inches wide, while both the larger models have 15½-inch drums 2½ inches wide. The gasolene tank in the smallest machine has a capacity of 18 gallons and the tanks of the other machines hold 20 gallons each.

There are six springs behind the leather facing of the aluminum cone clutch, so that when properly handled its engagement will be gradual and easy. The gearset gives three speeds forward, selectively controlled, and all its shafts run on imported annular ball bearings. From the gearset the drive

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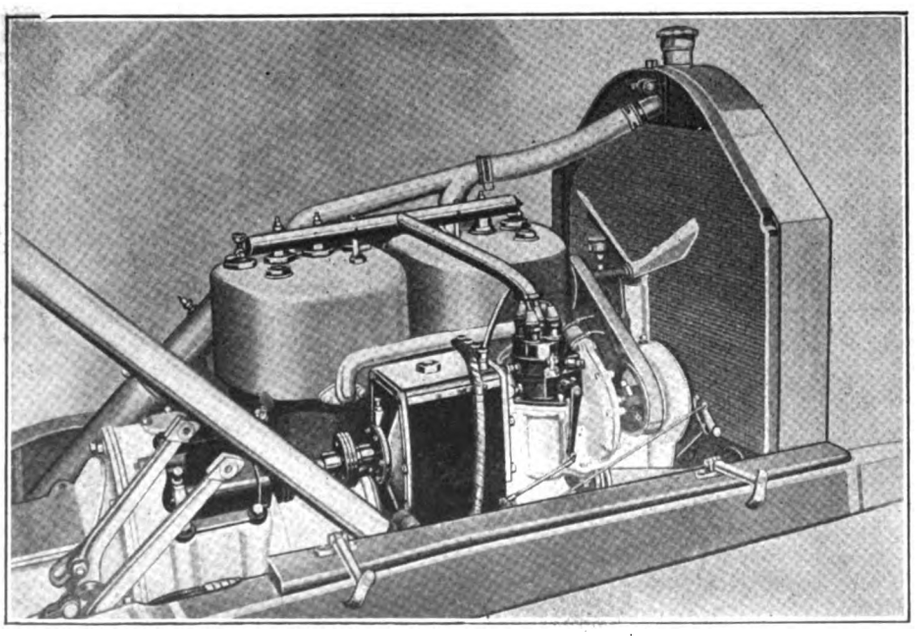
JUNIOR MEMBER OF THE COLE FAMILY: THE 40-HORSEPOWER 4 CYLINDER RUNABOUT

is through propeller shaft with two large universal joints. There are two torsion rods, arranged in the familiar triangular form; the torsion rod joint is fitted with a grease cup.

The springs, which the Cole people feel particularly proud of, are semi-elliptic in front and three-quarter elliptic in the rear and are of steel of a quality that permits a guarantee against imperfections of all sorts.

The motor is lubricated by a constant level splash system, with a sight-feed on the dashboard—or, rather, on the special board on the cowl on which all the instruments are carried. A positively driven gear pump circulates the oil, which is carried in reservoirs holding 2½ gallons, 1½ gallons and 2 gallons in the "40" the "50" and the "six," respectively. The carburetter is of the double jet type and has an air adjustment that is manipulated through a lever on the steering wheel column. Cooling is effected by forced circulation of water through a cellular radiator; a one-piece three-bladed aluminum fan, familiar as a Cole feature, is employed.

A feature of the new Coles, and one that appears to be gaining in general favor, is that of mounting the various instruments on a highly polished board which is placed just at the rear of the cowl and tilted at such an angle that the instruments are plainly visible to the driver. The speedometer, the sight-feed which forms part of the lubricating system, air gauge which indicates the pressure in the gasolene tank, the ignition switch and the lighting switch all are carried on this board, in the order named from left to right. The button for the motor starting apparatus is placed on the sill of the driver's seat. The tail light is electric, and in order to keep the driver apprised as to its condition there is a lamp on the board which is wired in series with the tail light. The result of this arrangement is that if the tail light is broken or extinguished in any way, the cowl light goes out also, so that the driver will not remain in ignorance of the matter.



COLE UNIT POWER PLANT AND ELECTRIC MOTOR STARTER

Throughout the series the bodies are built on the straight-line plan. The running boards are longer than in former models because the mudguards, which formerly were brought far back from the front wheels, sloping gradually, have been turned rather abruptly and make a comparatively sharp angle with the running-board, the length of which thus is increased about 15 inches. The rear mudguard is practically unchanged, and lies as close as is practicable to the wheel. The spare tire, formerly carried on the right running-board, just back of the control levers, has been removed to the rear of the car, leaving the board clear except for the battery box.

The "40" mounts a five-passenger touring body and a roadster; the "50" a five-passenger body with extra seats, so that it can be converted into a seven-passenger machine, a four-passenger car of the so-called "toy tonneau" type, two-passenger roadster, three-passenger coupe and Berline limousine. The "six" carries the same bodies as the "50."

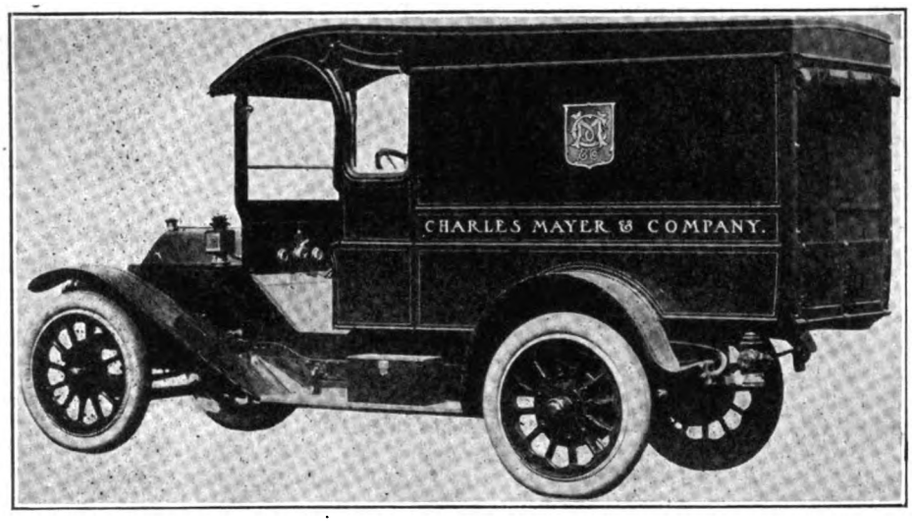
The Cole company believes in a liberal interpretation of the term "equipment," and all the cars of series eight are regularly fitted out with the Delco starting, lighting and ignition system already mentioned, top with side curtains and boot, windshield, speedometer, demountable rims and one extra rim, tire irons, number plates, folders and the usual outfit of tools.

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"COMMERCIAL" ON TOURING CHASSIS

Another Indianapolis Manufacturer Follows an Increasing Practice—1500-Pound Wagon for $2000.

Whether they builded better than they knew, or whether they knew what they were doing and built better than really was necessary, may be an open question; but in any case, the Motor Car Mfg. Co., of Indianapolis, Ind., has found that the chassis of its 40-horsepower Pathfinder pleasure car has all the sturdiness necessary for a delivery wagon carrying a load of 1,500 pounds, and accordingly, it is building commercial cars on the regular chassis. So far as the present season is concerned, the output will be limited. It is proposed, however, to turn out a large number for 1913. Naturally the decision to enter the commercial field with a pleasure car chassis was not reached hastily. On the contrary, much testing and many trials came first, and the manufacturers state that eminently satisfactory results were obtained.



PATHFINDER 1500-POUND WAGON THAT SELLS FOR $2000

The new delivery wagon, which is in the $2,000 class, has a 40-horsepower motor with cylinders 4⅛ inches bore and 5¼ inches stroke, mounted with the clutch and change-speed gear, forming a unit power plant. The cylinders are of the L-head type and are cast en bloc; as is usual with motors of this type, the crankshaft is carried in three bearings. A notable feature of the motor is the lubrication system, which is of the constant circulation type with dashboard sight feed, but instead of the usual single oil pump has two pumps. Cooling is by thermo-syphon system, there being no water pump. The clutch is a leather-faced cone and drives through a selectively controlled three-speed gearset, the shafts of which are mounted in annular ball bearings.

The axle construction is of high grade pleasure car type throughout, the front axle being a steel forging of I-beam section and the rear axle of the full-floating type, with pressed steel housing. Both service and emergency brakes are of the internal expanding type, both equalized and both 15 inches in diameter. A low center of gravity is secured by the employment of a double drop frame, which is carried on semi-elliptic springs all round, the front springs being 38 inches long and the rear springs 50 inches.

Pleasure car practice is followed even to the tires, which are 4-inch pneumatics carried by demountable rims on 34-inch wheels; the wheelbase is 120 inches and the tread standard—56 inches. It is intended that the Pathfinder delivery wagons shall be handsome vehicles, and to this end the same attention is given to the finish as is given to the finish of the pleasure cars.

Where Dull Months Proved Active Ones.

According to reports of the Franklin Automobile Co., of Syracuse, N. Y., July and August, which generally are considered the dull months in the automobile trade, were months of remarkable activity, at least so far as Franklin sales were concerned. The Franklin year closed on August 31st, when the figures for July and August showed an increase over the corresponding period of last year amounting to 435 per cent. and 330 per cent., respectively. In January the increase was 86 per cent., and in February 100 per cent.

World-wide Campaign for Wire Wheels.

Riley (Coventry), Ltd., of Coventry, Eng., has set itself to awaken the whole world to the advantages of detachable wire wheels. To that end it has engaged Chas. Stulik to visit practically every country in which automobiles are used. His itinerary includes the Central and South American Republics, Australia, New Zealand, Japan, China, India, United States and Canada, and even such out of the way places as Madagascar, Corea and Mauritius.

MOTOR COOLING AND EFFICIENCY

Actual Effects of Cooling on Cylinder Walls —French Scientist Advocates Spherical Combustion Heads.

The extreme care that is exercised by manufacturers in developing the details of motors and the importance that is attached by dealers to matters that might perhaps appear to be comparatively unimportant serve to emphasize the fact that the gasolene motor has reached a stage where improvements are practically confined to the little things that, after all, really are so big. There are some phases of the operation of a motor that must be closely studied in order to bring about the desired perfection of details, but which are extremely difficult to observe. This is true to a notable extent of the exact action and effect of the means adopted for cooling the cylinders, for the effects are produced within the combustion chambers. Therefore no small interest attaches to the article contributed by a French scientist, M. Carles, to "La Technique Automobile et Aerienne." The intimate knowledge shown of the conditions and of the effects of cooling are highly interesting. It is worthy of note that the author makes the unqualified statement that the spherical combustion chamber is the best from a scientific point of view, and that it is so recognized by French motor builders.

The translation is as follows:

"The higher the compression pressure and the smaller the heat lost through the wall of the cylinder head the higher will also be the maximum value of the explosion pressure. This occurrence, almost intuitively anticipated by engineers, is fully verified by actual experience; and photographic diagraphs—the only reliable evidence in connection with high speed engines—show that with other conditions unaltered, the highest pressure and temperature invariably obtain for the least intensive cooling of the combustion chamber. If consecutive graphs are taken from the moment of starting—that is, when the metal is cold—until normal running is reached, it will be found that the maximum pressure is comparatively low at starting and gradually increases with the temperature of the cooling water until it reaches its normal value. The obvious inference is formulated in one of the most important rules of engine design, and is often expressed by saying that the temperature of explosion is affected by the shape of the combustion chamber, the ratio between its inner surface and its volume, and by the degree of intensity of the cooling.

"The pressure of the gases causes the piston to move and gradually uncover the cylinder wall. The latter is lined, as it were, by a thin film of oil distributed round the bore by the piston on its upstroke.

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When the bore is being uncovered by the piston the hot gases do not immediately come into contact with the metallic wall but with the protecting oil film. At this moment two alternatives are possible; either the thinness of the film and the chemical composition of the oil permit the film to be burnt away entirely, thus leaving the metal bare, or the film is capable of resisting the destroying action of the hot gases. In both cases, however, lubricant will be burnt; nor could it be otherwise, considering that it is in immediate contact with gases at a temperature of over 2,000 degrees Fahrenheit and in an atmosphere where oxygen is not wanting. That such is the case is amply proved by the fact that every engine consumes a certain amount of lubricant per horsepower per hour.

"In connection with the above fact it is sometimes assumed that the combustion of lubricant must necessarily yield power and accordingly even an excessive consumption of oil, in some quarters at least, is not objected to. This inference, however, has never been verified in actual practice. The lubricant has first to be volatilized and partly decomposed, and the different physical and chemical processes involved thereby absorb a certain amount of heat. When the actual combustion of the oil occurs the required oxygen will have to be supplied by the mixture in the cylinder. The carburetter being adjusted to supply the correct proportion of air and gasolene, it follows that the oxygen absorbed by the lubricant is not available for the gasolene and the combustion of the latter will be incomplete. The calorific value of the lubricant being lower than that of gasolene, nothing, therefore, is gained by substituting the latter as fuel.

"The foregoing considerations point to the necessity of discriminating between the phenomena which obtain in the cylinder proper and those which occur in the combustion chamber. The less the latter is cooled, the higher will be explosion pressure, and accordingly, other conditions remaining the same, the higher will be the efficiency of the engine. The important factor that determines the minimum degree of cooling is the danger of self or pre-ignition. With the high compression pressure sometimes adopted it is matter of real difficulty to avert the danger just mentioned, especially when large engines are contemplated. The spherical cylinder head undoubtedly reduces the losses during the explosion, but the surface cooled is also correspondingly smaller while the volume of gas, and, therefore, the heat developed, are the largest possible.

"Within the cylinder proper, however, the conditions are entirely different. In this case the object of the cooling is to prevent the uncovered film of oil between piston and cylinder wall at any point of the stroke from being burnt away and so prevent the piston from seizing in the cylinder. Moreover, cooling has also the effect of ensuring uniformity of expansion of the metallic wall, and also keeps this expansion within pre-determined limits. Provided these requirements are met, little importance attaches to the degree of intensity of cylinder cooling; since however intense it is it cannot possibly prevent the combustion of a part of the lubricant in contact with the hot gases. If the cooling effect is just sufficient to satisfy the above requirements, we may reasonably expect a larger consumption of lubricant, but the efficiency of the engine will remain practically unchanged.

"The largest fraction of heat-loss occurs at the beginning of the stroke, when the gases are in immediate contact with the unprotected walls of the combustion chamber and when the velocity of the piston is very small. As the piston gathers speed, the expansion of the gases causes their temperature to decrease very rapidly; so much so, that it has been found that under certain circumstances the temperature towards the end of the stroke is lower than that of the cylinder wall. That the heat loss during the second half of the explosion stroke is but small is proved by the fact that the mean effective pressure is hardly affected by an appreciable advance in the opening of the exhaust valve.

"It will be seen, therefore, that we are quite satisfied in saying that of the heat units lost during the working stroke, 60 per cent. find their way to the cooling water through the combustion chamber at the moment of the opening of the exhaust valve. One-half of the last named fraction will again find their way through the cylinder head, as this is entirely exposed to the hot gases, so that, in the end, 80 per cent. of the heat lost during the stroke is lost at the combustion chamber.

"It may be urged that if this is a correct analysis of the distribution of the losses as it actually occurs on our engines, all cooling of the cylinder proper could conveniently be dispensed with. Experience, however, teaches that cooling, whether directly by air or indirectly by water or other means, must be used if the engine is to work at all, for the reason that a certain number of heat units find their way through the cylinder wall but mainly during the exhaust stroke, and as the film of oil already referred to has been gradually destroyed or greatly reduced during the expansion, when the exhaust period begins the metallic wall is left practically unprotected. A large number of heat units may then find their way to the cooling water, but it must be remembered that they are for all intent and purpose already lost, as the working stroke is completed and the exhaust valve is open. Experience also fully endorses these considerations, for it is a well-known fact that engines provided with auxiliary exhaust ports at the bottom of the stroke are more easily cooled than any normal motor. If the cylinder were left uncooled this transference of heat would cause its temperature to attain values for which no lubrication would be possible, without even taking into consideration all troubles resulting from cylinder distortion, etc. Cylinder cooling is imperative by mechanical requirements alone; but from the aspect of thermal efficiency this cooling has practically no effect, and it is quite immaterial whether so many heat units reach the radiator instead of the exhaust box as long as they cannot be converted into useful work.

"With large engines for which the ratio of surface to volume of the combustion chamber tends to decrease, it is reasonable to anticipate a better efficiency than for motors of smaller size. If we are to rely on the somewhat scanty information available, this anticipation does not appear to be realized in actual practice. While the losses through the combustion chamber proper are smaller, on a larger engine the piston constitutes a factor not to be neglected. If for the sake of higher efficiency high temperature is allowed for the cylinder head, it will be found necessary to cool the piston; that is to say, what is gained on one side is lost on the other. Moreover, a large engine must generally be strong and economical. To meet the last requirement it is generally run on as weak mixture as possible, which practically neutralizes the advantage derived from a reduction of the ratio of surface to volume. That the influence of the combustion chamber is the main factor of the thermal efficiency of an engine is proved by the popularity of the spherical cylinder head which is now a feature of any well designed engine. Of two motors of equal bore and stroke, one with a spherical cylinder head and the other without, the advantage will be with the former; for assuming the oil film was destroyed in both cases, less heat units will be lost through the wall of the spherical combustion chamber than through the wall of the other.

"With a weak mixture or too low compression the combustion of the mixture is somewhat sluggish and continues during the whole of the working stroke and often later. Under these conditions it is clear that a large fraction of the loss will occur during the exhaust stroke, the oil film being rapidly destroyed as proved by the large consumption of lubricant which generally obtains under these conditions.

"These considerations clearly show that the cylinder head constitutes the chief factor as far as thermal efficiency and cooling are concerned. The cooling of the cylinder wall has practically no effect on the efficiency, as for this part the losses mainly occur during the exhaust period, that is, when all the heat available cannot possibly do any useful work. The ideal arrangement would be to have forced cooling of the cylinder and a much less intensive cooling of the combustion chamber. It is to be feared, however, that the resulting uneven expansion of the metal might cause other difficulties which would more than offset whatever advantage is realized by this arrangement."

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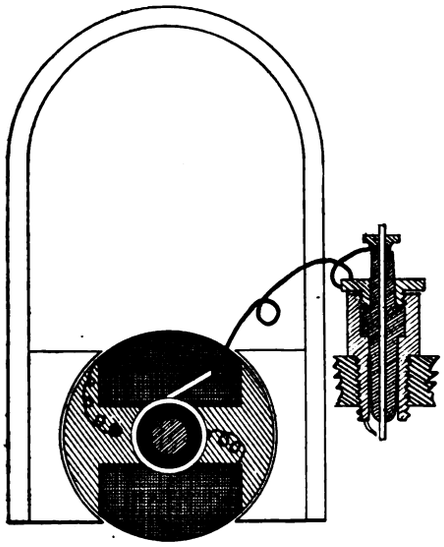
MAGNETOS AND DYNAMOS; WHEREIN THEY DIFFER

Principles that Underlie the Construction of Machines that Generate "Juice"—How Permanent Magnets Differ from Electro-Magnets and How They Are Employed in Generators—Commutators; What They Are and What They do—Simple Explanations that Relieve Confusion.

"It's a great system," the Salesman was aying. "When the motor is running, the ynamo generates the current for the imps and the magneto generates the cur-ent for the ignition. The battery——"

"The dynamo and the magneto both gen-rate current, do they?" interrupted the in-uisitive prospective purchaser. "Well, ay, if they both do the same thing, what's ie difference between them?"

"Oh, lots," replied the Salesman, care-essly. "The magneto generates high-ten-on current and the dynamo low-tension urrent."



ELEMENTS OF THE MAGNETO

"Oh, I know that. You're missing my oint. There are magnetos that generate ow-tension and dynamos that generate igh-tension current, aren't there?"

"Yep," said the Salesman.

"Well, then, what's the difference be-veen a magneto and a dynamo—I mean ie mechanical difference?"

"There's quite a lot of difference," said ie Salesman, a trifle uncomfortable at be-g driven into a corner by a red-hot pros-ect. "It's very scientific and complicated, ough, and it really doesn't make much ifference. If you like I'll get one of our igineers to explain it to you," he finished, eakly.

"Don't trouble," said the prospect. Thought maybe you could give me the ain points offhand. Well, I'll drop in gain later on," and he was gone, leaving ie salesman in an unenviable frame of ind.

"Why didn't you tell him?" enquired the Sales Manager, who had overheard the conversation.

"For the same reason," said the Sales-man, a little savagely, "that I don't tell you whether he's ever coming back again—be-cause I don't know. That's why."

"Well, well, now, there's nothing much to get peeved about. Would you like to know the answer to the question he asked you?"

"Yes, I would," assented the Salesman, with real interest.

"In the shortest way of telling it, a mag-neto has field magnets that are permanent magnets—like a common horseshoe mag-net that you can pick up bits of iron with—while a dynamo has electro-magnets, which are magnets made of a coil of wire around an iron core. There is no magnetism in such a magnet unless current is passing through the wire coil."

"Is that all there is to it?" snorted the Salesman. "I thought it was a whole lot of high-brow engineering stuff that nobody could understand."

"No, that isn't exactly all; there's more of it that isn't so very hard for a man of your intelligence and perspicacity to com-prehend." The Manager's eyes twinkled. "Come into the office and I'll show you a few sketches that will help you out—that is, if you want to."

"Well rather!" and the Salesman and his boss adjourned to the managerial sanctum.

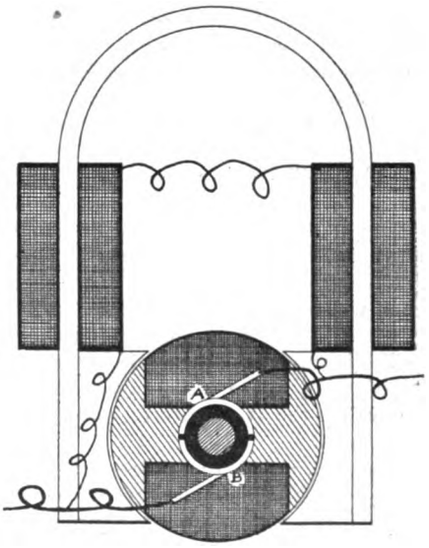
"It has been my experience," began the Sales Manager, assuming the tone and manner of a lecturer, "that the average man doesn't want to go so very deeply into the intricacies of a machine, unless he happens to be more or less of an expert—and then he won't need to ask many questions. All that most men want is to get satisfactory answers to questions. Now, if you could have told your friend about the magnets it's more than likely he would have been quite satisfied and you'd have been talking to him yet—or maybe you would be ad-miring his signature on the bottom of an order."

"Have mercy!" groaned the Salesman. "Don't rub it in, boss."

"All right," agreed the boss, with a grin. "See if we can't rub it out next time your friend comes around. Now, you might as well start in at the fundamentals—I mean the simple ones—so that you'll really under-stand the thing. To begin with, all the elec-tricity-making machines used on cars are built around the same principles, no matter how different they may look. First, you've got to have a magnet, or several magnets. Now, you know if you take a magnet and gradually bring the business end of it to-ward a little piece of iron or steel the mag-net will begin to pull it quite a bit before they touch; a magnetic influence radiates from the magnet and is called the magnetic field."

"That is," interjected the salesman, "the magnetic field, as you call it, is where there's a pull on the iron."

"That's it. Here's the next thing. Take a coil of wire—or just a single loop, for



SIMPLEST FORM OF DYNAMO

that matter—and pass it through the mag-netic field and a current will be produced in the wire. Never mind why. That would be going altogether to deep. Just take it from me that that's what happens. A cur-rent is generated in the wire, and if you want to use the current all you have to do is to collect it from the ends of the coil. Magnetos and dynamos are just machines for making coils of wire pass through mag-netic fields. Take a magneto, to start with. The coil of wire is made to pass through the magnetic field by winding the wire on a sort of revolving cylinder, and mounting the cylinder between the 'live' ends of a series of horseshoe magnets. Of course, every time the cylinder—which is the arma-ture, of course—goes round the coil goes through the magnetic field and gets loaded with 'juice' that only needs a way of escape. Here's a sketch that shows the principle of the thing. Those arched things are the

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magnets. You'll notice that there are two pieces of iron secured to the ends of the magnets with a space between them just a trifle larger in diameter than the armature, so that when the armature revolves its circumference is very close to these iron affairs."

"What do you call those things?" asked the Salesman.

"Pole pieces," replied the boss. "The business ends of a magnet are called the poles, and these attached pieces are called the pole-pieces. You know, the closer you bring your bit of iron to the magnet the stronger the pull is. Well, if you pass your coil through the place where the pull is strong you get a strong current, and vice versa. So the armature is kept just as close as it possibly can be to the pole-pieces, which really are the ends of the magnets, inasmuch as the magnetic field starts from their surfaces"

"I see," said the Salesman, bending over the sketch. "What's the idea of having those two deep notches in the armature? Are they all wound full of wire?"

"Yes. You see, if you wind the armature with a great many turns of fine wire you get a current of very high voltage, while if you use a smaller number of turns and heavier wire you get a lower voltage. Of course, in a high-tension magneto the voltage has to be 'way up, so there's a whole lot of thread-like silk-covered wire wound round and round the armature until it fills the spaces. The wire is wound on lengthwise of the armature, and not the way thread is wound on a spool. All magnetos are not wound exactly the same way, but this is the commonest and simplest type, so we'll stick to it; the principle is the same in all of them, when you get down to it. This is called the H armature; you can see why, I guess."

"I get you," said the Salesman. "But tell me something. There are two pole-pieces, and every time the armature makes a revolution the coil goes through the magnetic field twice. Isn't that right"

"Right," said the boss.

"Well, then, doesn't the coil get loaded with 'juice' twice every time the armature goes round?"

"Right, again. It does. And the direction of the current is reversed each half revolution, so that you get what is called an alternating current."

"But how do you 'get it'? You can't stand by with a fork and pick it off the ends of the wires as they sail around."

"Don't get facetious, young fellow. Here's the idea. One end of the coil is grounded—that is, it is scraped clean of its insulation and soldered down to the iron core of the armature, which is in contact with the rest of the machine through the shaft and bearings, and, to get a bit further, the whole car is connected up to that grounded end of the wire because the magneto is set on a metal bracket on the motor frame. The other end of the coil is attached to a brass or copper ring which is very carefully insulated from 'ground'—which means all the machine except the insulated parts—by a ring of fiber or hard rubber on the shaft. That black ring in the sketch is the insulating ring. A brush, which may be a finger of metal or a little rod of carbon, rests on the ring; the sketch doesn't show the brush holder, because it would only complicate matters. Electricity is like a driving belt; it has to go round a complete circuit and return to the place it started from, or there's nothing doing at all. The sketch shows a spark plug in the circuit, but the timer is left out for the same reason the brush holder is—it doesn't affect the principle; it's only a sort of switch for turning the current on and off at the right times. Suppose the current generated in the armature coil comes out at the brush end of the wire. It passes to the collecting ring, then through the brush and wire to the central electrode of the spark plug, down into the cylinder and jumps across the sparking points to the shell of the plug. Now, you know, the shell is in direct contact with the cylinder, and the cylinder is in contact with the crankcase, and the crankcase is in contact with the magneto frame and the magneto frame is in contact with the other end of the wire, and of course the current follows this path back to the armature coil—and there's your complete circuit."

"But, good Lord! do you mean to say that when the current is free to wander all over the whole blooming car it will pick out that one little point of wire and sneak back into the coil that way?"

"That's it, exactly. It's a fixed and invariable law that the current will take the shortest and easiest path back to the place it came from, and utterly ignore all the rest of the 'ground.' There's no other way it can get back into that coil except through the ground, and so it goes that way. And, of course, you don't need a wire when you can use the frame of the machine for one, and so you save the extra conductor. Another wire could be used, of course, by using two collecting rings and two brushes and insulating both points of the plug instead of only one—but what's the use? You don't gain a thing and you get more complication and more wire to look after."

"I guess it has penetrated," said the Salesman. "But where does the distributer come in on this game, and what's——"

"Hold on, hold on! This started out to be a lecture on the difference between a magneto and a dynamo. Give the dynamo a chance, will you? Now, if you think you've got the fundamentals in your head, take a look at this sketch of a dynamo, which shows practically the same style of construction, for the sake of simplicity, only you see that there is a coil of wire wound round each of the legs of the magnets. Further, the magnets, or, rather, the cores, are not of magnetized steel, but of very soft iron or steel of special quality, which is not designed to hold magnetism. The pole-pieces are magnetized and a magnetic field produced by passing a current through the coils on the field magnets."

"I see that, but where do you get the current for the magnets?"

"Borrow it from the current generated by the armature. A small proportion only of the current is used in this way. Let's get back to the connections. It isn't usual in a dynamo to ground one wire, though in some cases it can be done. If you want an alternating current, the same as we got with the magneto, just use a second collector ring and brush and attach the other coil end to it instead of grounding it. But most of the dynamos we use are 'direct current' machines—that is, the current flows in the same direction all the time, instead of changing its direction every half revolution. The sketch of the dynamo shows how this is done. Instead of using two collector rings there is one ring, insulated in the same way, but cut in half and the halves insulated from each other; the insulation is shown in black. The ring now is called a commutator, because it commutates, or changes, the current. Each section of the commutator is connected to one end of the coil of the armature. The way it works is to take a sort of mean advantage of the current. Say the current flows out through section A around the circuit and back again through section B. When the armature makes half a revolution—and the commutator, of course, goes with it—the direction of the current is reversed, and it flows in through A and out through B. But the two sections have changed places and the same brush that carried the outgoing current from section A now carries the outgoing current from section B, so that the flow is kept going in the same direction all the time. The current is led off from the brushes and carried to its work. To energize the field magnets a wire leads off from one of the main wires, goes round the two field coils, which are connected together so as to be all one length of wire, and back to the other feed wire."

"Here!" interjected the Salesman. "Let me butt in. Didn't you tell me the current would always take the shortest and easiest way round?"

"I did, my son."

"Well, why doesn't all the current just go round through the field coils instead of taking the trouble to divide up and go outside and work?"

"Good question!" said the Manager. "The current certainly will go the easiest way, so the wire in the field magnet windings is made rather fine, or else there is a great deal of it, or maybe both, so that it offers more resistance to the flow of current than the job out at the ends of the feed wires. In this way only a small part of the current squeezes through the field coils. The more resistance there is in the fields the less current will get through them and the weaker the magnetic field will be. This makes it easy—when you know how to figure it—to take just the proportion of

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current you want for the fields, and so make them of any strength you like."

"Don't they generally have more than two sections to a commutator?"

"Yes, they do; anything up to many hundreds of them, but the principle is the same all through. There are more coils if there are more sections, and each end of a coil is connected to a commutator section. Of course, where there are so many coils you can't put so much wire in each; but it's like a multi-cylinder engine. What you lack in the size of each you gain by having a lot of them, and the impulses are closer together, so that there is a more continuous flow of current."

"I see. Well, here's another question. You say there is no magnetic field in a dynamo unless there is current passing through the field coils, and again, you say that a magnetic field is essential to the operation of a generator. Now, then, if the thing has no magnetism in it, how the deuce does it ever get started?"

"Good one!" cried the boss. "You're alive, all right. Well, I'll have to modify one of those statements just a little. There always is just a trace—a bare suspicion—of magnetism in all iron and steel. This remains always, and usually is sufficient to create a very faint current in the armature winding when the machine is run pretty fast. This faint current passes through the field coils, and the poles are magnetized a little more, which generates still more current in the armature, which sends more to the magnets, which increases the strength of the field, and so on, round and round, until the current picks up to full strength, which it does very quickly, indeed. This faint trace of magnetism is known as 'residual magnetism' and is present more or less in all iron or steel, and for this reason a generator usually can be started right off, though once in a while it is necessary to pass a current through the field windings before the machine will generate the first time."

"Thanks. I gotcha. Now, just one more. What's the difference between a generator and a motor, and, if there is any, how do they run lighting generators as starter motors, and why don't they do the same with magnetos?"

"For the love of Mike, man, be reasonable! Leave that for another time. Anyway, if I'm not mistaken. that's your prospect coming down the street. You might just accidentally happen to be at the door as he passes, you know."

"So I might!" exclaimed the salesman, rushing for the door and putting on brakes and coming to a dignified walk as he passed out and stood complacently viewing the show windows of his rival across the street. "So I might."

Making Room for New Process Gears.

The New Process Rawhide Co., makers of rawhide gears, has filed plans for an addition to its plant in Syracuse, N. Y. It will have four stories, 60 x 160 feet.

JOHNS-MANVILLE GOES INTO RIMS

Asbestos Products Company's Spark Plug Venture Is Followed by a Demountable—Has but Two Main Parts.

Simplicity in construction as well as in the method of operation are among the cardinal features of a new demountable rim which, without preliminary announcement, has been brought out by the H. W. Johns-Manville Co., of New York, widely known because of its asbestos productions, and which only recently added spark plugs to its manufactures. The rim is styled the J. M. demountable rim, and, as the accompanying illustration shows, consists of but two main parts, there being no small, loose parts that are likely to be lost or mislaid.

The J. M. rim consists essentially of two bands, each of which carries one of the



J-M DEMOUNTABLE RIM

raised beads which hold the tire in place. One, the main tire-carrying section, is a continuous unbroken ring, while the other is split diagonally and slips inside the solid rim, where it is retained by dowels projecting from the under side of the main ring and engaging in depressions formed in in the split ring. In mounting a tire the gue in the main ring fitting into a groove in the slight ring. In mounting a tire the main ring is laid flat on the floor, the tire slipped on and the split ring entered with the dowels matched up with the depressions and pressed into place with the foot, when the dowels and tongue snap into place and the rim and tire are ready to mount on the wheel, where five simple clamps hold them securely in place.

The removal of the rim and tire is a simple process. No special tools are required, though an offset wrench is provided as a particularly convenient tool for loosening the clamp nuts. Beginning at the top of the wheel, the uppermost clamp nut is loosened one turn, which permits the clamp to drop, by its own weight, clear of the rim. The wheel then is turned so as to bring the next clamp to the top, and the process is repeated until all five clamps are slacked off. After each clamp has fallen clear of the rim the nut is tightened up slightly to keep the clamps out of the way. The rim then can be easily slipped off the wheel, and a slight pry with a screwdriver or the special combination tool that goes with the rim will start the rings so that they can readily be separated. In mounting the rim the process is just reversed; the clamp nuts are loosened, after the rim has been placed on the wheel, beginning at the bottom, so that as the nuts are slacked the clamps fall into place, when a tightening turn brings them up against the rim.

As the two rings overlap for their entire width, dust and water cannot enter from underneath; further, the tongue and groove form a block against the passage of dirt. The J. M. demountable rim can be used with any standard clincher tire, either quick detachable or regular. It is made of cold rolled steel and is Sherardized so that it is proof against rust.

Removing Nipples Without Marring.

To unscrew a short pipe nipple from a fitting without marring the threads is almost an impossibility if the nipple is firmly screwed in place. The feat can easily be accomplished, however, by screwing over the threads a coupling of malleable iron one side of which has been split by sawing with a hacksaw. The pipe wrench should be plied over the coupling after the latter has been screwed on the nipple as far as it will go. The elasticity of the metal will permit the coupler to seize the nipple and the latter can easily be removed without marring.

Unusual Source of Ignition Trouble.

An unusual cause of ignition trouble which is most frequently encountered in magneto ignition which calls for short gaps between the points of the plug, is caused by a slight displacement of the grounded electrode which usually is affixed to one side of the shell of the plug, when the plug is forced into the threads. Where the gap is small, short circuiting ensues, although upon removal the plug is in perfect condition. The remedy is to file a couple of threads flat at a point near the grounded electrode, which will give a little clearance and avoid pressure.

Washing Out the Gasolene Tank.

Washing out a gasolene tank with water is a most unsatisfactory proceeding, unless there is some positive means of getting out the last drop of moisture after the washing has been done. If there is any doubt as to getting out the water, it is better to avoid its use by washing the tank with kerosene, the remains of which will mingle with the gasolene and do no harm whatever.

Substitute for Broken Steering Wheel.

A broken steering wheel may be replaced, temporarily, by two wrenches wired in place pointing in opposite directions, like wheel spokes. If two stilsons are available they can be applied so that they grip when pulled toward the rear of the car.

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MOTOR TRUCKS AS RAILWAY'S RIVAL

Road Freighting That Made the Rivalry Real—Dividends From System Planned for Convenience Only.

Although there never was the slightest doubt that motor truck transportation is very much more costly than freight haulage over long distances, that the converse is true where distances are not greater than the normal radius of the motor vehicle equally is obvious. The principal saving arises from the lesser time taken to load and unload the truck, due to its extreme flexibility as compared with the train.

Another point which should not be lost sight of is that with motor haulage the goods can be moved at the time most convenient for the shipper, which sometimes, if the goods are to make connections for further transportation either by rail or water, may mean the saving of several days time. In this connection, the experience of the estate of E. R. Ladew, which operates a leather and belting manufactory at Glen Cove, L. I., and which installed a motor delivery service a little over a year ago, is interesting.

Though started largely to gain satisfactory delivery to its New York City headquarters, about 35 miles away, the decision to try the motor truck came as a result of an inability on the part of the company to obtain what it regarded as fair steam railroad freight rates and proper despatch in making shipments in severe winter weather. It did not expect, as was shortly proved to be the case, that by getting its products into New York City the same day they left the factory no less than 36 hours would be saved in reaching Chicago; and soon from serving merely the Ladew factory needs, other factories, but principally merchants in towns along and the routes followed by the truck, sought the company's assistance in the matter of carrying package freight on the return trips from New York to the factory. Before long additional trucks were added, making three all told; a separate company was formed to take care of the growing transportation business, and the trucks now move on established time schedules, work under published rate schedules and receive and deliver merchandise for points lying between Oyster Bay, N. Y., and New York City.

The specially interesting fact about the transportation business which developed (it might be said, without effort and without intention on the part of the company) is that not only does it cost the company less for shipping its material, not to mention the saving in time referred to, but the use of the motor trucks has proved a source of profit, allowing for the justifiable formation of what is known as the Glen Cove Transportation Co. This statement is based on records which have been kept on the operating cost of the automobiles, including interest on the investment, depreciation and insurance. These figures have been translated for the interest they will have, in terms or on the basis of the former freight cost which the use of the motor trucks displaces. It will be noted from the percentage figures as here tabulated that the total operating cost amounts to 94.6 per cent. of the total amount paid in one year for freight, the tabulation referring, of course, to one year's operating costs. While there have been other years in which the freight cost may have been less so that the total yearly cost for operating the motor trucks would be greater than this freight cost, it is to be remembered that the motor truck freight delivery shows a profit. In fact, the Glen Cove Transportation Co. is able to accept shipments to New York City from the Estate of E. R. Ladew at a lower rate than could be secured from the steam railroad. What the gross receipts are or what the profits figure out to be have, of course, no direct bearing on the present account of the successful inauguration and interesting outcome of a somewhat unassuming flirtation with the commercial motor vehicle.

Three automobiles are operated, being a 3½-ton Packard bought in January, 1911, and running about 12½ miles an hour. The other two are a Benz-Gaggenau truck rated at 5 tons at a speed of 15 miles an hour and a 5-ton Alco car having a maximum speed of 8 to 9 miles an hour. As ordinarily operated the heavy trucks make the round trips to New York each day, covering 70 miles in each case, while the third car is engaged in making the lighter or local deliveries covering about 30 miles a day. The merchants and householders in the various towns and communities commonly provide for purchases, say in New York City, to be sent to the company's headquarters, 82 Fulton street, New York, where they may be collected and delivered to the house or store of the consignee on the return trip of the truck. In certain periods of the year much of the work performed by the trucks is the moving of furniture, and besides freighting to New York City the trucks may take a somewhat longer course and deliver to desired points in Brooklyn. As an additional service a horse truck is used in New York City. The cost of upkeep of this truck is not charged against the motor transportation business, as the horse truck was formerly maintained and is still a requirement of the New York warehouse of the Ladew establishment.

According to the table of operating costs, as given by the "Iron Age," depreciation is figured on a five-year life for the 3½-ton truck and a four-year life for the others, thus writing off 20 per cent. in the one case and 25 per cent. in the others. Interest is figured at 6 per cent. The cost of labor covers a driver and helper for each car. The garage cost is small, partly as the machines are housed in a part of one of the buildings of the Ladew factory, though it is believed that an equitable charge is made as regards this item. The repair cost is, of course, the actual expense involved in upkeep. The insurance item covers not only insurance for fire, theft of machines and liability insurance, but also a policy on the floating contents of the trucks. In comparing the relative percentages of the cost items, it should be added that the three cars are believed to average together about 170 miles daily for a total of 305 days in the year.

Yearly operating cost of motor trucks based on the annual cost of steam railroad freight which they now handle follows:

Depreciation	16.3 per cent.
Interest	6.3 per cent.
Labor	36.7 per cent.
Gasolene and oil	12.6 per cent.
Rental of garage	1. per cent.
Repairs	12.6 per cent.
Insurance	9.1 per cent.

The Glen Cove Transportation Co. is operated under the managership of A. J. W. Hyde, under the general supervision of James R. Taylor, manager of the Estate of E. R. Ladew. Shipments are made and the business generally is conducted after the manner of a publicly recognized general service corporation, waybills of a distinguishing color being sent to consignees, drivers taking receipts on corresponding blanks and a receipt book, for example, being carried by the truck driver for goods picked up en route.

Extemporizing a "Fishing" Magnet.

A few yards of insulated wire wound around the end of an iron or steel rod, or even the end of a screwdriver, will make a little lifting magnet for fishing small bolts, nuts or the like out of inaccessible places. The two ends of the coil should be connected to the terminals of the battery, but the current should be used for as brief a time as possible, as it is likely to draw rather heavily on the supply.

Graphiting That Lessens Labor.

While the use of a little soap makes the driving of a wood-screw easy, a little graphite grease has a more marked effect and will enable a screw to be turned in where it could not be worked otherwise. The same holds good in the case of machine screws that are tight in their threads.

Drill Grinding That Is Not Perfect.

A twist drill that has been broken can be ground again to a cutting edge and used with fairly satisfactory results; but the angles are not quite the same as at the original cutting end, and so the best results cannot be obtained. Moral: Don't break drills if it can be helped.

Current that Will Damage Magnetos.

The current from a battery never should be allowed to pass through the windings of a magneto, for the result is likely to be demagnetization of the magnets; if the current is sufficiently heavy, it will burn out the winding also.

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Costs of Truck Service Compiled by Massachusetts College

Although motor truck operating cost ata have from time to time been compiled oth by automobile manufacturers and by otor truck users, and these have served eir useful purpose, it is doubtful if any hich have heretofore been published have een as broad in scope or as carefully and ystematically prepared as those which are ow in the course of preparation at the assachusetts Institute of Technology, om which the annexed tables are abstract-l. The work already has occupied several onths and before the results finally are ublished in full, it is not unlikly that many ore months will have been occupied in etail work.

The tables, which are being compiled from, ie actual performances of the vehicles as dicated by charts and tapes which are ken from mechanical indicators with hich the vehicles are equipped, are not onfined to figures relative to the cost of perating and the details of operation of otor driven vehicles alone; horse-drawn ucks also are included, and for this type f vehicle the tables will be just as com-lete as for either the gasolene or electric ucks, which are listed separately.

The work begins with a summarization of ie actual daily work performed by the ve-icle and the number of hours taken for the ork. The first table compares the average daily performance of a 1,000-pound and a 4,000-pound electric, a 3,000-pound and a 6,000-pound gasolene, and a one-horse and a two-horse truck, for a period of 15 days.

While the tables are not yet in such shape as will allow much comparison as regards performance and cost of operation, some few comparisons which prove interesting can be made. For instance, comparing the data from the 2,000-pound electric vehicles

AVERAGE PERFORMANCE OF SIX TRUCKS, DEDUCED FROM TAPE RECORDS FROM FEB, 1-15, 1912.

Rating in Pounds.	1000 lb	4000 lb.	3000 lb.	6000 lb.	One-Horse.	Two-Horse.
Type	El.	El.	Gas	Gas	Wag.	Car
Service	A	B	C	D	E	F
Miles per day	30.1	14.7	45.7	13.9	18.5	13
Number trips per day	2	4.11	3.6	2.3	6.6	3.9
Number stops per day	25.1	8.7	34.6	13.7	23.6	11.2
Miles per trip	12.5	3.6	12.7	6.1	2.8	3.3
Office to first stop, miles	3.3	....	3.8	....	....	....
Last stop to office, miles	3.1	....	2.6	....	....	....
Hours in use per day	9.8	8.4	11.6	9.1	10.9	10.8
Hours running with load per day	2.9	....	....	....	....	1.1
Hours standing per day	6.6	6	7.6	6.9	6.8	7.1
Average hours loading per trip	0.57	....	....	....	....	0.66
Average hours unloading per trip	....	....	....	....	....	0.54
Number pieces delivered per trip	14	....	8.4	....	....	....
Weight initial load per trip, lb	....	1,330	....	....	....	....
Ton-miles per day	....	7.4	....	....	....	....
Average running speed on long runs, m. p. h.	9.6	6.5	14.8	7.6	5.2	3.6
Average running speed throughout day, m. p. h.	9.3	6.2	11.5	6.8	4.6	3.5
Days used	13	13	14	11	13	13
Days out of commission	....	....	....	1	....	....
Days ready but not used	2	2	1	2	2	2

Service classification: A, city parcel delivery; B, miscellaneous hauling for electric-light company; C, suburban baggage call and delivery; D, miscellaneous freight handling; E, city pick-up for various companies; F, inbound and outbound freight for manufacturer. The average temperature during the day varied between 16 and 27 deg. Fahr., 5.5 inches of packed snow being on the ground at the beginning of the period, with a partial thaw later. No precipitation occurred.

SUMMARY OF REPORTS FOR GASOLENE TRUCKS.

	2000-lb.	2000-lb.	3000-lb.	6000-lb.	6000-lb.
General:					
Company	No. 9	No. 9	No. 85	No. 4	No. 4
Business	El. Lt.	El. Lt.	Miscel.	Packing	Soap
Service	Spare	Instal.	Hauling	Hauling	Hauling
Period of data	25 mo.	32 mo.	13 mo.	8 mo.	12 mo.
Number of trucks averaged	1	1	1	1	1
Truck—cost	$2,312	$1,934	$2,400	$3,700	$3,624
Truck—age	25 mo.	32 mo.	13 mo.	8 mo.	12 mo.
Company's number	59	39	1	.....	.....
Performance—Annual:					
Miles	4,263	10,067	5,850	7,442	7,172
Gallons of gasolene	653	1,075	931	.....	1,965
Days used	125	250	298	258	295
Days out of commission	.....	.....	.....	.....	.....
Trips	.....	.....	2,480	665	966
Stops	.....	.....	.....	.....	.....
Weight of loads, lb.	.....	.....	1,316,000	3,152,000	3,535,000
Expense—Annual:					
Operation—					
Running repairs	$404.64	$518.76	$36.85	.....	.....
Lubricants	18.00	14.40	16.27	$60.10	$32.02
Gasolene	69.60	112.08	107.10	226.00	255.06
Garage	271.20	228.00	0.00	208.00	50.00
Sundries	15.12	19.32	.....	14.45	7.53
Driver	247.08	705.36	1,009.12	1,036.00	1,100.00
Maintenance—					
Tire	19.92	151.56	150.00	584.00	111.05
Overhaul				442.00	17.60
Painting	45.24	190.32	62.13	.....	.....
Fixed Charges—					
Amortization	768.00	648.00	600.00	925.00	906.00
Administration	60.84	50.16	.....	.....	.....
Interest	.....	.....	120.00	222.00	217.00
Insurance	.....	.....	125.00	191.00	93.00
Taxes	.....	.....	.....	.....	.....
Company's total expense	$1,919.64	$2,637.96	$2,226.47	$3,908.55	$2,789.26

SUMMARY OF REPORTS FOR HORSE WAGONS.

	One-Horse	One-Horse	One-Horse
General:			
Company	No. 15	No. 9	No. 68a
Business	El. Lt.	El. Lt.	Trucking
Service	Service	Service	Miscel.
Period of data	12 mo.	16 mo.	12 mo.
Number of units averaged	109	75	2
Ratio of horses to wagons	1	1	1½
Investment	$485	$580	$700
Performance—Annual:			
Miles	.....	.....	.....
Days each horse worked	.....	.....	270
Days each horse unable to work	.....	.....	.....
Trips	.....	.....	.....
Stops	.....	.....	.....
Weight of loads	.....	.....	.....
Expense—Annual:			
Operation—			
Shoeing		$41.00	$45.00
Veterinary	$205.20	10.20	7.50
Feed			219.00
Stable	156.00	290.80	85.50
Repairs	96.00	75.30	.....
Sundries	.....	12.50	7.50
Driver	660.00	650.00	528.00
Fixed Charges—			
Amortization	48.50	76.20	182.50
Administration	25.80	47.00	170.00
Interest	.....	.....	36.50
Insurance	.....	.....	22.50
Taxes	5.04	.....	7.50
Company's total expense	$1,196.54	$1,203.00	$1,311.50

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with the data from the gasolene propelled trucks of the same weight, it is found that the daily operating cost of the first gasolene truck is $15.35, whereas the cost of operating the electric is but $6.38. The gasolene propelled truck, however, covered 34 miles daily while the electric covered but little over one-third as many—11.9 miles—so that from the cost per mile basis, the gasolene vehicle is slightly more economical than the electric vehicle. In the second instance, however, the operating costs of the electric are not so great per mile as with the gasolene vehicle. The second gasolene vehicle covered 40.2 miles at a daily expense of $10.55, whereas the electric covered well over half that distance —23.7 miles—with an expense of but $4.55.

Comparing the operating costs of the two 3,000-pound electrics with the cost of operating the gasolene machine of the same capacity, the balance is all in favor of the electrics. The daily expenses of the electrics figure to $7.43 and $7.48, respectively, with the distance covered at 32.7 and 35.5 miles. The daily cost of the gasolene vehicle amounts to practically the same—$7.47—but the mileage—19.6—is far short. The comparison, however, should not be taken as a standard comparison between the cost of operating the two types of vehicles, for obviously no definite conclusions as to the relative cost of operating vehicles of different types can be drawn from single instances. It is only when the tests and compilations have been so far advanced that comparisons of the average performances of a dozen or more vehicles of each type performing the same class of work are available, that figures which really are worth while can be obtained. As for the horse-drawn truck, the tables so far completed show absolutely nothing with regard to the performance of the vehicles, so that only the annual expenses can be compared. On the whole, the annual cost of upkeep of a horse-drawn vehicle, as shown in the three instances tabulated, is quite a little below the annual upkeep cost of the 1,000-pound electric.

One Way to Keep the Motor Clean.

Working on the theory that the only way to keep a motor clean is to prevent the ingress of dirt into the hood through the intermediary of the radiator passages, a British motorist has evolved an arrangement which at any rate precludes the possibility of the dirt-laden air reaching the motor. Directly behind the slightly V shaped radiator is placed a V shaped baffle plate which deflects the air after it has performed the cooling functions, and returns it to the outside of the hood through slots or passages cut in the sides of the hood. Though the advantages in the way of keeping the motor free from grime may be many with the arrangement, it is doubtful if such an installation is conducive to the maintenance of a cool motor. Outside of the fact that it absolutely prevents the use of a fan to circulate the air, which, in itself, is sufficient to affect greatly the cooling of the motor, and especially so if the car is left standing for any length of time with the motor running, it is evident that the positioning of the baffle directly behind the passages must act as a choke to the free passage of the air, and the flow through the radiator passages is greatly lessened as a result. With the usual order of things, the flow of the air around the outside of the jackets plays no mean part in removing the jacket heat and keeping the temperature of the motor down; with the baffle in position the flow of air around the outside of the jackets is prevented, which also would tend to cause a rise in working temperature. Undoubtedly the device would operate successfully were the motor and cooling system specially designed, for exactly the same system has been in use on several cars in which the radiator is positioned on the dash for years, but to apply the system to a car which is designed to operate with a free flow of air through the radiator augmented by the action of a fan, and in which the radiator is as small as is consistent with good operation under these—and only these conditions—would seem foolhardy.

Testing Condition of Battery Cells.

A rough and ready idea of the uniformity—or otherwise—of the condition of the different cells of a storage battery may be obtained by feeling the jars after charging or after a rather stiff discharge. Any cells that are much "off color" are sure to be warm.

SUMMARY OF REPORTS FOR ELECTRIC TRUCKS.

	1000-lb.	1000-lb.	2000-lb.	2000-lb.	3000-lb.	3000-lb.	5000-lb.	7000-lb.
General:								
Company	No. 49	No. 79	No. 9	No. 9	No. 15	No. 15	No. 4	No. 9
Business	El. Lt.	El. Lt.	El. Lt.	El. Lt	El. Lt.	El. Lt.	Glue	El. Lt.
Service	Lamps	Lamps	Maint.	Maint.	Meters	Lamps	Hauling	Operating
Period of data	16 mo.	12 mo.	16 mo.	17 mo.	20 mo.	26 mo.	5 mo.	26 mo.
Number of trucks averaged	1	1	1	1	1	1	1	1
Truck—cost	.....	.....	$2,812	$3,797	.....	.....	$3,900	$4,900
Truck—age	16 mo.	34 mo.	78 mo.	17 mo.	20 mo.	26 mo.	5 mo.	26 mo.
Company's number	.....	2	4	69	18	15	.....	49
Battery	Lead	Lead	Lead	Alkaline	Lead	Lead	Lead	Lead
Performance—Annual:								
Miles	5,797	3,989	3,415	6,924	9,727	9,988	6,292	3,643
Kilowatt hours	.....	1,704	2,084	5,520	3,786	3,704	.....	4,034
Days used	.....	293	290	292	297	281	238	300
Days out of commission	.....	23	.....	.....	15	37	.....	.....
Trips	.....	.....	.....	.....	.....	.....	399	.....
Stops	.....	.....	.....	.....	.....	.....	.....	.....
Weight of load, lb	.....	.....	.....	.....	.....	.....	.....	1,659,000
Expense—Annual:								
Operation—								
Running repairs	$44.11	$37.06	$373.34	$85.44	$229.68	$229.68	.....	$151.68
Lubricants	1.71	3.50	14.52	17.28	.....	.....	$4.40	17.28
Electricity	.....	85.20	.....	.....	151.44	148.16	112.83	.....
Garage	.....	307.50	257.16	320.52	111.96	111.96	120.00	280.08
Sundries	.....	.....	8.40	24.72	55.56	47.77	31.70	16.44
Driver	.....	728.00	0.00	0.00	747.36	768.80	704.00	945.84
Maintenance—								
Battery	124.20	187.71	398.76	73.44	157.36	55.58	.....	126.24
Tire	0.00	0.00	132.24	205.20	98.16	137.65	0.00	215.52
Overhaul	231.73				76.84	46.67	93.47	65.28
Painting	58.02	113.60	152.04	125.40	44.63	23.81	.....	.....
Fixed Charges—								
Amortization	.....	264.00	468.72	408.00	230.00	230.00	975.00	816.00
Administration	.....	.....	45.72	69.84	62.52	62.52	.....	59.76
Interest	.....	110.00	.....	.....	150.00	150.00	234.00	.....
Insurance	.....	182.56	.....	.....	15.00	15.00	152.00	.....
Taxes	.....	.....	.....	.....	77.50	77.50	.....	.....
Company's total expense	$459.77	$2,019.13	$1,851.00	$1,329.84	$2,208.01	$2,105.10	$2,427.40	$2,694.12

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POSITIONING OF SPARE TIRES A PRETTY PROBLEM

With the Running Board as a Repository Eliminated by Front Doors the Rear of the Body Now Most Generally Obtains—Stowing Out of Sight Is of Unquestioned Desirability but Presents Difficulties to the Designer—Varied Examples of Ingenuity.

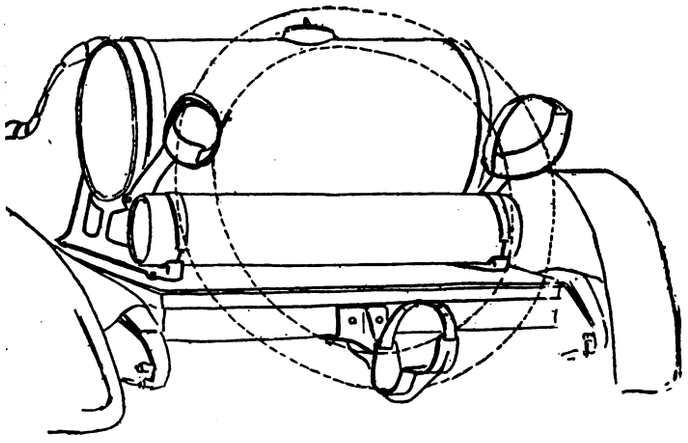
When automobiles were innocent of ront doors and their now apparent utility as not realized, the positioning of spare res on the running board was never ques-oned. Probably those designers who first ositioned the spares on the right hand unning board reasoned that since the rela-ive positions of the control levers and the teering wheel did not permit of free en-rance to the driver's seat from the right and side, the complete blocking of the assage would cause little, if any, incon-enience. When the practice first was in-ugurated, such was the status of motor ar designing, that the matter of appear-

With the adoption of left hand control, however, the necessity for a change in the location of the spare tires became even more keenly felt. In some few instances where the control levers were positioned on the left hand side, the location of the spares was shifted to this side also, the position on the running board being similar to that which obtained with the right hand driven car. Where the control levers were placed in the center and thus acted more or less as a barrier to prevent passage from one front seat to the other, the necessity of keeping both of the side entrances obstruction free became obvious, and a search for a more suitable storage place for the extras became necessary. The rear position instantly found favor, not because a brace of spare tires hanging over the rear improved the appearance of the vehicle, but because in this location the bulky necessities were out of the way and out of sight of the car occupants and because search revealed no location which could be utilized with so little additional designing. But few will maintain that the rear position adds to the looks of any car, indeed on big limousines, particularly, it is almost a blemish.

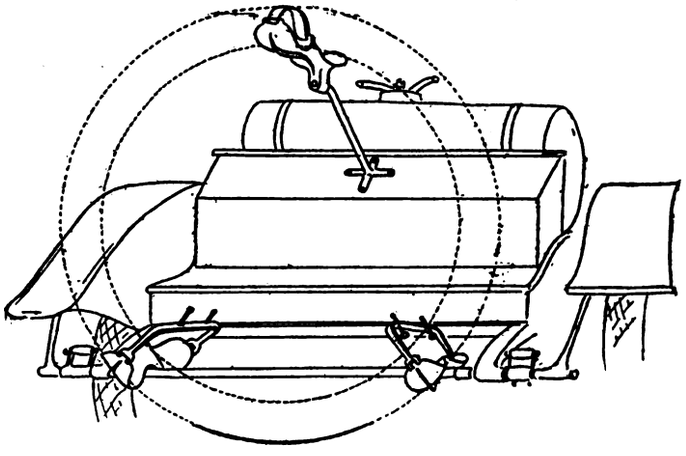
Time was when the outside location for the shoe was not necessary, for with the small wheel diameters and the high hung bodies which prevailed a few years ago, a position under the floor of the tonneau which could have been made easily accessible through a door in the rear could easily have been arranged, but at that time the running board position was not considered objectionable. With present day body styles, however, the problem of locating extra shoes, or even a single spare in an enclosed location is extremely complex, if not impossible. As the wheel diameters have increased, so have tires become bulkier, and at the same time low hung bodies have attained greater favor, so that in nearly all of the modern chassis a "kickup" in the frame to allow clearance for the rear axle is a necessity, and in some few instances an inverted well in the floor of the tonneau also is necessary to allow clearance for the differential housing. With such construction the possibilities of locating spare tires under the tonneau flooring without increasing the height of the body are slim, and to increase the height of the body is to put the body out of style.

Other inside the body locations are not more promising. It has been suggested, and the idea has been incorporated in the design of a foreign car, that a location in a pocket at the rear of the front seat which easily would be accessible by raising a hinged cover would be the ideal location, but such a pocket would necessarily be at least six inches in width, which is added to the five or six inches more which are represented by the upholstery, all of which room must be taken from the tonneau. The tendency at present is to increase the room in the bodies and every half inch of leg room that can be added for the comfort of the passengers is considered quite an item, so that the cutting off of six inches at a clip would not be hailed with delight.

As for the methods of supporting the tires in the rear location, practice varies with the different makes of cars and the different types of bodies, from a trio of



VELIE BRACKET DESIGN



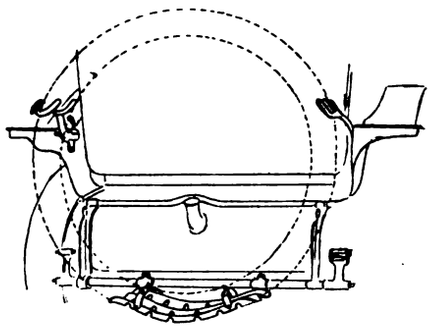
SPEEDWELL BRACKET CLAMPS

nce was a secondary consideration; every-hing in the way of the appearance of the ar was sacrificed if need be, to ensure de-endable functioning.

So universal did the practice of posi-ioning the spares on the right hand run-ning board become, that it was not until he utility of the front door began to be ecognized and the advisability of shield-ng the driver and the passenger who oc-upied the front seat as well as those who ode in the tonneau from the cold blasts ecame more apparent, with consequent re-designing of bodies in general, and the gradual adoption of the front doors, that he inconvenience of the orthodox spare tire position was felt. Even then unwill-ingness to sacrifice the position of the spares gave rise to more or less queer methods of treating the enclosure of the front seats, such as providing the car with a hinged door only on the left hand side and a solid panel on the right hand side or sometimes simply a leather apron.

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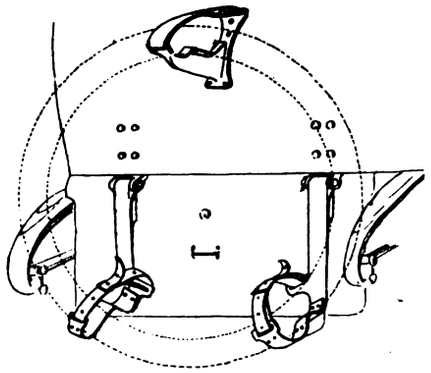
more or less simple supporting brackets to ingenious structures, much more elaborate in nature. As a rule, it has been the purpose of the designers when positioning brackets on touring cars of limousine bodies, to keep the body paneling free from brackets, and this practice has given rise to not a few complex structures. For appearance sake, the brackets in the majority of cases are arranged to support the tire so that the plane is parallel with the back



AMERICAN "CRADLE" RACK

of the body, though there are those who are not particular as to this part of the arrangement.

The tire carrying rack on the American underslung car is novel in that it embraces the use of a cradle or basket in which the lower portion of the tires rests and which is attached to the rod, which also serves as a pivot for both spring shackels. The basket is formed of cast iron and is perforated for the sake of reducing the weight. The device is attached to the rod by means of a pair of clamps which are adjustable by means of set screws. The upper brack-

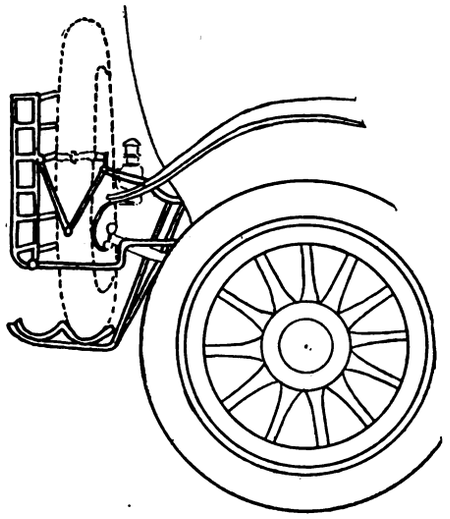


THOMAS HINGED BRACKETS

ets are rigidly bolted to the brackets which support the rear ends of the mud guards, which, in turn, are riveted to the frame. The tires—the device is designed to carry a pair of extras—are not fastened in the upper brackets, the forks being of sufficient length to prevent undue movement; the basket is provided with a pair of straps which encircle the shoes and prevent them from jouncing out.

On the Knox car the tire carrying brackets have been combined with a trunk rack. Similar to the American practice, the lower bracket is fitted with a cradle designed to carry two shoes, and which is supported by a pair of wrought iron arms which reach up to the rear cross member of the car frame, where they are rigidly attached. The upper brackets, too, are attached directly to the rear cross member of the frame and are provided with straps which serve to retain the tires. The folding trunk rack, which is of orthodox design and construction, is fitted with extra long brackets which position it at the rear of the tire carrying brackets. The folding arms which support the device when in use are pivoted to the upper tire irons. When not in use the rack folds up flat against the extra shoes.

National practice embraces the use of a pair of lower brackets and a single upper hook. The lower brackets which are provided with cast iron shoes for the reception

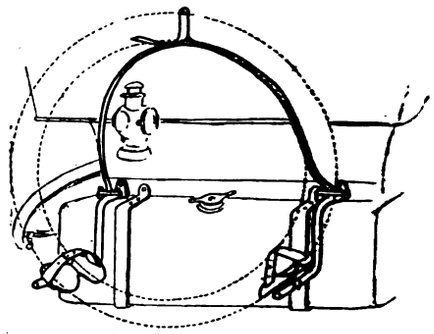


KNOX DOUBLE CONTRIVANCE

of a pair of extras are riveted to the car frame. By way of keeping the rear panel of the body free from brackets, the upper hook is supported by a looped piece of heavy wrought iron bar, which, in turn, is bolted to the lower brackets, at either end. Straps are fitted only to the lower brackets, the necessity of holding the tires onto the upper bracket being obviated by the pitch of the device which keeps the shoes in place.

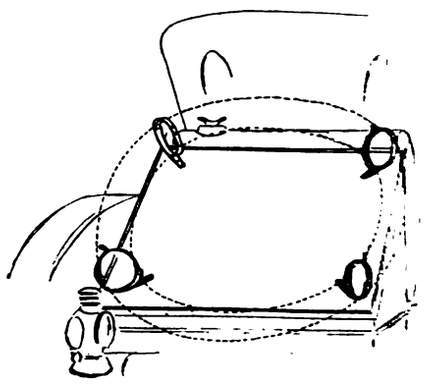
On the Thomas car, the brackets are made of substantial malleable iron castings, and unlike the usual practice they are attached directly to the body of the car, being firmly riveted to the ribs which serve to stiffen the rear panel of the body. Each of the brackets, which are designed to carry a pair of spares, is provided with a heavy strap and, by way of protecting the casings from chafing, which, if the spare is carried in the brackets for any length of time might be severe, each of the three brackets is faced with heavy leather belting riveted in place with copper rivets. The two lower irons are made in two pieces, the lower sections which are provided with the tire rests are pivoted to the upper sections and are free to be swung upwardly, the object being to allow of the opening of the tool box which is positioned under the rear of the body.

Although the positioning of the tires on the outside of the car body is, with the present body styles, more or less of a necessity with touring cars and limousines, with the two-seated cars such is not the case. In the King roadster, for instance, a suitable compartment has been provided at the rear of the body for the storage of a



NATIONAL "LOOPED" SUPPORT

pair of extra tires, where they are kept free from the action of the elements and are out of sight. That similar practice will be inaugurated by other manufacturers there seems to be not the slightest doubt, but the demand for roadsters of "racy" appearance militates against the practice at present. A great many folks fancy that a roadster is not "classy" in appearance unless it is fitted with at least a single spare tire, and since there generally is plenty of room at the rear of the two-seated cars,



MARION MOUNTING

that location generally is chosen for the positioning of the tire irons.

Practice with regard to the positioning of the tire irons on the Marion Roadster is simple in the extreme. On top of the tool box cover are screwed four brackets which are shaped to receive a single shoe and which are provided with the orthodox retaining straps. The cover of the tool box, which is hinged, can be opened without removal of the casing.

With the Velie roadster, the lower of three malleable cast brackets which are provided for the reception of the spare is riveted directly to the cross member of the

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frame. The two upper brackets are extensions from the brackets which serve to support the fuel and lubricant tanks, which are positioned on the rear deck of the car. As is usual, the brackets are arranged for the reception of a pair of spares which are retained in position by straps.

Speedwell practice is distinctive in that the straps on the lower two brackets which are supported on the bar which serves as a pivot for the spring shackles as in the American construction, and as a support for the mudguard brackets, are replaced by special screw clamps which hold the tires or demountable rims, as the case may be, firmly in place. The upper bracket is exceptionally long and is attached to the tilted side of the tool box by means of the base piece which is in the form of a crow's foot. A strap is employed to retain the tires in the upper bracket.

On the Marmon roadster, the spares simply are dropped over the short cylindrical gasolene tank which is positioned on the rear deck, their own weight serving to retain them in position. On the Abbott-Detroit "submarine" model, a special screw bar-clamp is employed similar to the clamps which retain manhole covers in position.

Whether designers ever will be able to provide an interior compartment for the spares is a pretty question which is far more easily asked than answered. To stow them out of sight is highly desirable, but whether it is possible time alone will tell.

Solution for Restoring Tarnished Nickel.

Nickel plating which has become worn or tarnished easily can be retouched by rubbing over it with a rag a solution of 3 parts tin, 6 parts nickel, 1 part iron, in a mixture of 100 parts of hydrochloric acid and 3 parts of sulphuric acid. The object then should be rubbed with a rag which has been dipped in finely powdered zinc, the rubbing operation being continued until a coating of nickel has been deposited. In places where the iron shows, the latter should first be treated with a solution of copper sulphate until a thin layer of copper has been deposited, which renders the nickel plating operation more certain.

Little Ills That May Beset Batteries.

The greatest possible care should be exercised to prevent foreign matter from getting into storage battery cells and settling across the tops of the plates. A bit of metal or other conductor of electricity can easily cause a short-circuit between two plates and make an amount of trouble that seems all out of proportion to the size of the trouble maker.

One Method of Lengthening Valve Stems.

A valve stem that has worn short can be lengthened by driving on a short section of steel tube, filling the projecting end of the tube with a pad of fiber and filing down the whole to the exact length required. Steel, of course, can be used instead of fiber, but it will make more noise.

HALLADAYS HOLD TO PAST PRACTICE

Three Models Continued, Including Big "Six"—Simplified Electric Starter a New Feature—Small Car Has More Power.

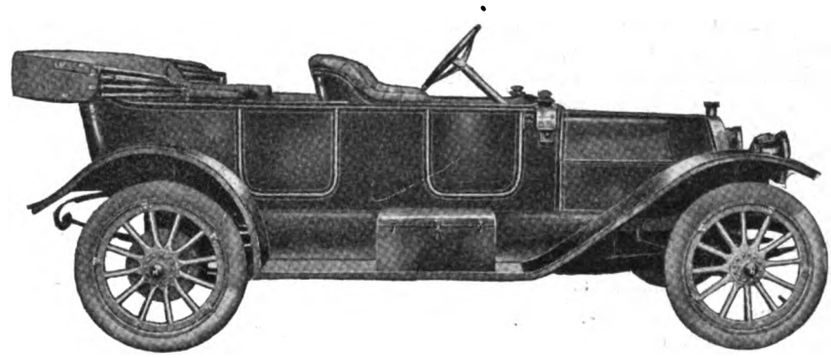
Three chassis, which with various types of bodies make up a total of seven different models, comprise the 1913 line of Halladay cars manufactured by the Streator Motor Car Co., of Streator, Ill. In the number of chassis, as well as in the matter of mechanical features of the more important order, there are practically no changes. The line includes two four-cylinder cars and a "six," the latter being the most powerful machine; the motors are rated at 32, 40 and 60 horsepower, respectively, for the three chassis.

The Halladay cars are equipped with an electrical lighting and motor-starting system that has been developed by the Streator company. The apparatus weighs 40 pounds and has but 11 points of contact. The starting equipment includes a dynamo driven from the forward end of the crankshaft through a silent chain, and a storage battery which is housed in the tool box. The entire starter can be removed from the car in 15 minutes, and apart from the elimination of the motor starting feature, the only difference made is that the electric lighting system is put out of commission for the time.

The 32-horsepower car is practically the same as the 30-horsepower car of the previous season, though the power has been augmented a little and the usual and expected refinements have been added. The curves of the fenders have been slightly changed in order to improve their appearance, and guards have been fitted between body and fenders; the running boards and their binding have been made considerably heavier. Comfort has been enhanced by making the cushions 2 inches deeper and tilting them to an easy angle. The brakes have been enlarged and now are 14 inches in diameter, and both are the internal expanding type, well protected from the dust and dirt that accelerate wear. The motor is of the long stroke type, having cylinders of 3¾ inches bore and 5¼ inches stroke, with enclosed valves and a self-contained lubricating system. It is extremely quiet in operation.

The tires are of the wrapped tread type, 33 x 4 inches. In the matter of finish, brown, Brewster green and dark blue are given as options; the metal trimmings are finished in black enamel and nickel. Regular equipment includes a gas tank enclosed in a metal outer case, tire irons, an extra demountable rim and the usual tool and tire repair outfits.

The medium car of the trio, the 40-horsepower machine, has a four-cylinder motor of 4½ inches bore and 5 inches stroke and a double-drop frame that brings the center of gravity low and adds much to the appearance of the car as a whole. Compared with its predecessor of 1912, the changes made are of minor importance, and are much the same as in the case of the smaller machine. Generally speaking, the new car is better looking, more comfortable and, in short, is a considerably better car from any angle of view.



HALLADAY 5-PASSENGER TOURING CAR WITH DOUBLE DROP FRAME

The big car, the Halladay "six," has a 50-horsepower motor with cylinders 4⅛ x 5¼ inches bore and stroke, respectively; the cylinders, which are cast separately, are of the L-head type, with the valves all on the same side and housed under cover plates that are readily removed in case of necessity. Both crankshaft and camshaft bearings can be removed or adjusted from underneath when the lower half of the crankcase is off, as both are in the same horizontal plane. Valves are lifted by levers with rollers at the contact points to minimize wear. The motor connecting rods are somewhat longer than is usual, in order to cut down side thrust and wear, and the piston pin end is made with a split head held by a clamping bolt and lock nuts. The crankshaft is supported by seven bearings of die-cast babbit. Lubrication is by a circulating system; the lower part of the crankcase is used as an oil reservoir, into which the lubricant drains through a strainer and from which it is pumped again to the surfaces which are to be lubricated. A float with an indicating rod gives visible indication of the height of oil in the reservior; the float is in a separate chamber. There is a complete double ignition equipment, including two sets of plugs; current is supplied by Bosch magneto and a battery as an alternative.

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A. A. A. COMPLETES TROPHY DESIGN

Successor to Glidden Prize Proves to Be Cup of Striking Craftsmanship—Other Details of Reliability Tour.

Although through long association the name Glidden persists in clinging to the Detroit-New Orleans tour which starts October 7 under the title A. A. A. 1912 National Reliability Tour, the famous Glidden trophy, as is well known, will not be the chief prize at stake. Its successor, the A. A. A. trophy, has been completed and next week will be placed on exhibition at the A. A. A. headquarters at 437 Fifth avenue, New York.

It takes the form of a silver cup which is 24 inches in diameter and 25 inches high and which is symbolic of the national character of the cross-country expedition. The handles of the prize are two eagles of solid metal, beneath which are conventionalized automobile wheels, while around the top of the cup is a border depicting touring scenes in Yellowstone Park, a preserve from which the automobile as yet remains banished, and in California, Mount Washington and the South. Centered in the front of the device is a cartouche within which appears the emblem of the A. A. A., the interlaced automobile wheels with the initials of the association in high relief. On either side of the cartouche are figures symbolizing endurance and speed, one figure expressing transmission of power. Encircling the cup's base is a border of ivy entwined with ribbons bearing the names of the state associations which are affiliated with the national body.

The reverse of the trophy bears a laurel wreath, emblematic of victory. The complete trophy weighs more than 300 ounces, or about 25 jeweler's pounds, and rests upon an ebony base, the top of which reposes upon a turntable so that the cup may be viewed from all sides without lifting.

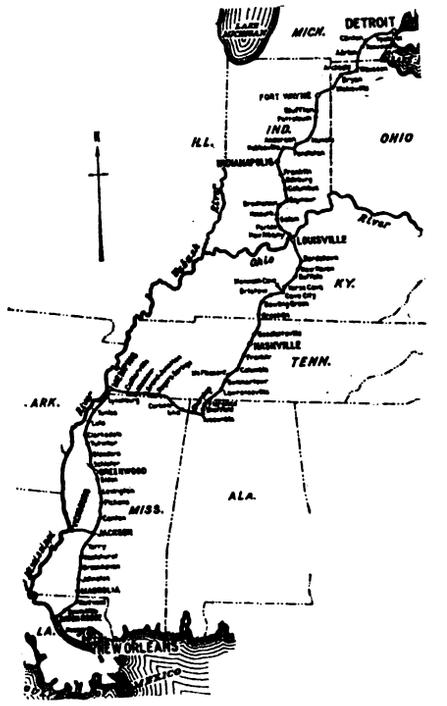
The tour itself will extend over a distance of 1,600 miles, which is 500 miles more than was anticipated before the pathfinding was completed; the day's journey will approximate 135 miles. The shortest day's run will be that ending at Mammoth Cave, where a day of pleasure will be spent, for Judge Albert C. Janin, the trustee for the estate which owns the cave, has given his personal attention to arrangements and has planned a tour of the cave such that the visitors will have opportunity to witness its varied wonders. On the night of arrival dinner will be served in the cave and will be followed by a ride on Echo lake, 360 feet below the surface of the earth.

At Vicksburg, Miss., the tourists will visit the $2,000,000 Highland Park, which commemorates the siege and defense of that city in 1863, and Jackson, Miss., determined not to be outdone, has planned an immense barbecue which, to a long line of hungry motorists, ought to make Jackson a spot on the map to be remembered; the governor of the state, with other notable men, will receive the visitors.

S. A. E. Shows Appreciation of Clarkson.

Richly deserved appreciation of the services of Coker F. Clarkson as secretary and general manager of the Society of Automobile Engineers was expressed last week in the gift to him by other members of the association of a 1913 Hudson five-passenger touring car; the automobile carries stock equipment, including an electric motor starter. In making the presentation the engineers laid emphasis upon the work the recipient of the gift had accomplished in his labors to effect standardization in motor car manufacture.

Route of A. A. A. Reliability Tour



Chicago Truck Test Again Postponed.

Lack of a sufficient number of entries to warrant the running of the event was responsible for the postponement for the second time of the Chicago Motor Club's reliability tour for commercial vehicles, which was to have left the Windy City on Monday last, 9th inst., on a two days' run through the state. The event originally was scheduled to start on September 3rd. Although no date for the start has been announced, it is understood that it will take place sometime during the month of October.

Dozier Heads New Texas Club.

The Taylor Automobile Club has been formed in the Texas town of that name. M. A. Dozier is the president and Howard Bland, Jr., and James A. Thompson are, respectively, secretary and treasurer.

CITY'S AUTOMOBILE LAWS INVALID

Chicago Judge Declares "Smoke" Ordinance Inoperative and Discharges 146 Offenders—Decision to be Appealed.

Somewhat startling though it may have been to the municipal lawmakers, Judge Freeman K. Blake, acting as a police magistrate, on Saturday last, 7th inst., ruled that Chicago's ordinance governing the smoking of motor cars is invalid because of the state statute governing automobiles which has been decided by the Supreme Court to be "exclusive"; in accordance with his ruling, he discharged 146 offenders who had been haled before him and who previously had been paying fines of $5 and $10 without protest. Judge Blake's ruling is to be carried to a higher court, and to expedite matters he, himself, is to sign a certificate of urgency. His action in declaring the ordinance invalid and his comment upon automobile municipal law in general is interesting generally because few cities exist which do not have municipal as well as state legislation governing the use of automobiles.

Judge Blake held that the City Council has no right to pass any ordinance limiting the use of automobiles, the last Legislature having passed an "exclusive" act for the whole State of Illinois.

"The last Legislature," he said, "passed an act covering the use of automobiles throughout the entire state, and the Supreme Court has since held that this act was 'exclusive,' that is, the state having undertaken to legislate on this matter, city councils and similar bodies in various cities and towns have no right to interfere by legislating on the same subject.

"It was intended by the state legislature that all automobilists should be governed by the state act. That being true, the Supreme Court held in two cases, and I hold in accordance with such decisions, that the 'smoke' ordinance is invalid.

"The same ruling probably would apply to any ordinance regulating the use of automobiles passed by the city council of later date than the act of the Legislature, though my decision to-day was solely on the 'smoking automobile' ordinance."

Clipping Springs Better than Stretching.

Stretching a valve spring or a helical spring used for any other purpose is not always satisfactory for, after a little usage, the spring assumes its original shape. A better plan is to shorten the spring, not by compressing the coils, but by clipping off one or two and blocking up to make up for the lost motion with washers. This has the effect of increasing the tension of the spring only when the tension is needed and the coils are relaxed at all other times, so that the spring does not acquire a permanent set and grow weak.

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TRANSCONTINENTAL PROJECT TAKES PRACTICAL TURN

Carl G. Fisher, of Indianapolis, Evolves Plan that Holds Abundant Promise—$10,000,000 to be Raised by Automobile Industry by Contribution by Manufacturers and Dealers of Trifling Share of Their Profits—Indianapolis Pledges $300,000—The Plan in Detail.

Although various "trails" have been blazed and various schemes have been proposed for the construction of a transcontinental highway, linking the Atlantic and Pacific seaboards, and the promoting interests have ranged from corporations and aggregations of private individuals to Uncle Sam himself, nothing definite has come of them until this week, when there was made a public a plan which originated more than a year ago in the mind of Carl G. Fisher, head of the Prest-O-Lite Co. and the Indianapolis Speedway, and which promises tangible results within a reasonably short time. Back of the plan are the motor car and accessory manufacturers of Indianapolis and Detroit, but in the building of the New York to San Francisco road every dealer and individual motorist, as well as every manufacturer in the trade, is to have an opportunity to help.

The highway as planned is to be of rock and the estimated cost is $10,000,000. The building of the road will be left to the county and state authorities with whom contracts will be made to complete the work within a certain time and according to certain instructions before the materials are turned over to them. The Fisher project proposes to raise the $10,000,000 from the motor industry by January 1st, 1913, or within a little over three months. Manufacturers and dealers will be asked to contribute one-third of one per cent. of their gross sales each year for three years, which will provide a fund greatly in excess of $10,000,000. Cash or notes will not be collected but donation slips issued, which slips will be turned over to a bond company to hold until the permanent organization, which will care for the purchasing and delivering of the material, is organized.

During the last 12 months Fisher has been accumulating data on the cost of road construction, cost of road materials, cost of cement bridges, cost of cement mile posts, etc., and has talked with many manufacturers to discover if they would cooperate in such a project. This part of the work started with the Indianapolis car and accessory manufacturers, all of whom agreed to the scheme, and at a meeting held Monday, 9th inst., the project formally was launched by every one of the makers agreeing to the plan outlined. A campaign will be made on the Detroit makers during the week, and it is expected that little difficulty will be encountered and that the industry will practically be a unit in supporting the enterprise. After Detroit, Cleveland, Buffalo, Toledo and the other motor centers will be visited in turn.

At the meeting held in Indianapolis on Monday, the trade of that city responded so generously to the enterprise that $300,000 was pledged on the spot. In order that every subscriber to the fund shall be protected, no construction of any nature will be started until the entire subscription has been guaranteed, and if for any reason the plan should fail all monies will be returned to those having made payment, with interest at 3 per cent. By having the required amount guaranteed by 1913 it will be possible to complete the work by 1915, so that the road may be used by motorists attending the Panama Pacific Exhibition, which opens in San Francisco in the spring of that year.

Instead of securing all of the financial assistance from the manufacturers and dealers, the plan includes the co-operation of all car owners in the country. This is possible by three classes of membership that will be provided for—one a $5 class and one a $100 class, the third being a $1,000 class. Radiator embelms of different types will be issued to each member, according to his class, and special wall or window medals will be given to all dealers who contribute a total of 1 per cent. of their gross receipts to the fund in three years.

The plans do not call for any particular route across the states. At present there are two or more trans-continental highways and the matter of deciding whether either of them or a different one is to be selected will be left to a commission of the motoring interests.

All monies collected or subscribed for the road will be used in the actual purchase of material, which will be purchased at a price which covers delivery at the railroad siding where needed. Prices for material range from 90 cents to $2 per cubic yard, depending on the distance the material has to be hauled. A conception of the amount of rock required for such a highway can be gained from the fact that a roadway 9 feet wide and with rock 12 inches deep cost $1,750 a mile for material. This presupposes a short haul. Although by route it is 3,300 miles from ocean to ocean, little more than 2,200 miles of trans-continental highway would call for stone construction, as there are approximately 900 miles of improved streets in cities, towns and villages on this course. This fact alone considerably reduces the problem of building such a highway. The fund of $10,000,000 will give approximately $5,000 a mile for road material. and since road material represents only from 30 to 50 per cent. of the cost of building a road, it means that instead of a $10,000,000 road across the country there in reality will be one that will approximate a value of $25,000,000.

The actual building of the road will be left to the directors of the state and county authorities to whom the materials will be turned over and will sign contracts to build the roads under government engineering inspection. Mr. Fisher has discovered that some of the best rock roads in northern Indiana and northern Ohio have cost but $1,750 a mile for material. It is natural that in building a stone road in Iowa the material will cost more because of the long haulage. This will amount to not over $800 a mile for any part of the country.

Many additional plans are being furthered in connection with this trans-continental scheme, one of which is the erection of sign posts, one for each donation of $1,000 secured on the plans outlined. Each post would carry a bronze plate bearing the name of the donor. Such posts will cost $12 each.

Still another plan is that of entering into arrangements with the telephone companies whose lines are on the selected highway to secure plugging facilities on the line, so that the motorist having a breakdown between cities can immediately get into telephonic communication with his dealer, a repairman or a garageman. Such a system as this is at present in operation in England and also in certain sections of Southern California. It is no Utopian dream that such an arrangement can be put into practical operation on such a highway.

The possibilities of travel on a trans-continental highway of this nature are unlimited. Supposing 25,000 cars were to make a return trip over such a highway, occupying 40 days. If each car carried four people the daily cost would be $20, or $800 for the round trip. At this same rate there would be an expenditure of $20,000,000 for the 25,000 cars. While this is a broad calculation so far as the number of cars is concerned, it will, however, serve to show the value to the towns and cities passed through of such a highway. Real estate values would increase all along the route; in fact, a stone road of this character would add almost 50 per cent. to these values in some sections.

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BURMAN SWEEPS BRIGHTON BEACH

Plays Star Part, as Usual, and Narrowly Escapes Accident—Ainslee and Lewis Take Minor Events.

Although Robert Burman succeeded on Saturday last, 7th inst., in lowering the time for a single mile over the Brighton Beach course to 47.85 seconds and thereby lowered the record for the distance on the mile circular track by .77 of a second, by slightly misjudging his clearance as he was attempting to pass Hickman (Mercedes) in the second heat which was run for the Remy Brassard and trophy, he also succeeded in putting both the cars out of the running and just escaped having the Benz which he was driving turn over upon him. The mishap occurred as the two contenders were finishing the second mile of the race and were rounding the curve preparatory to entering the home stretch. Burman attempted to pass on the left hand side of the Mercedes driver, but the forward wheel of his car touched the rear wheel of Hickman's machine and for a time it looked as if the Benz machine would turn completely over. A goodly portion of the nearly 6,000 spectators who were assembled in the grandstand or around the field flocked onto the track to inspect the damaged machines, and some little time elapsed before the Moross "militia" which policed the track could clear the course.

Besides lowering the track record and winning one of the two three-mile heats which were run for the Remy Brassard, Burman drove the Cutting car to victory in a five-mile Class E event for cars with a minimum weight of 2,000 pounds, leading home David Lewis (Stutz) and covering the distance in 4:45.48, and a 40-mile Class E event which he completed in the Ohio car in 42:09.27, again defeating the Stutz driver. The third contender in the 40-mile event, William Burke (Studebaker 30) was thrown from his mount when the car skidded during the 25th lap of the race. The accident was induced by the "blowing" of a rear shoe. Burke sustained a broken wrist and a few painful but not serious cuts. The second heat which was run for the Remy Brassard went to Harry Kyle (White), after Burman and Hickman, who had held the lead for the first two miles, were put out of the running. Kyle's time for the three miles was 2:57. The five miles free-for-all handicap was won by David Lewis (Stutz) in 5:04.23, with Kyle (White) in second place. A five-mile Class E event for cars with displacements of under 301 inches was won by William Burke (Studebaker 30) in 5:13.33. The summary:

Five miles, for cars with displacements of under 301 inches—Won by George Ainslee (Mercer); second, William Burke (Studebaker "30"). Time, 5:13.33.

Five miles, for cars with displacements of under 600 inches—Won by Robert Burman (Cutting); second, David Lewis (Stutz). Time, 4:45.48.

Three miles, for the Remy Brassard and trophy. First heat—Won by Robert Burman (Benz); second, Harry Kyle (White); third, Henri Hickman (Mercedes). Time, 2:46.86. Second heat—Won by Harry Kyle (White). Burman (Benz) and Hickman (Mercedes) collided and withdrew. Time, 2:57.

Forty miles, for cars with displacements of under 600 inches—Won by Robert Burman (Ohio); second, David Lewis (Stutz). Time, 42:09.27.

One mile, time trial; to lower the one-mile circular dirt track record—Robert Burman (Benz). Time, 47.85. Old record, 48.62.

Five miles, free-for-all handicap—Won by David Lewis (Stutz); second, Harry Kyle (White). Time, 5:04.23.

Motor Car Takes Hod Carriers' Jobs.

Give an ingenious man and a sturdy car a chance, and the working combinations they will develop often are surprising; in such a recent incident in Philadelphia, Pa., the manager of a garage exercised the ingenuity and a Regal touring car did the work with such success that five hod carriers were thrown out of work and the garageman figured he saved himself $60 a week. He was building an addition to his place of business and installed an elevator to lift supplies to the second floor, thus saving the employment of manual labor for this task. A rope, run over several pulleys, served to support the elevator, and the car, with the rope hitched to the rear axle, did the lifting. A run of about 60 feet along the ground was necessary to lift the elevator to the second story. At night the garage man unhitched his gasolene horse and made it take him home. Five gallons of fuel were used in three days' work.

Arrested for "Over-Observing" the law.

For doing more than the law required in relation to registration numbers and their illumination on his cars at night, Col. E. H. R. Green, son of Hetty Green, was obliged to appear in West Side Police Court in New York City on Monday of this week and plead for the discharge of two of his chauffeurs; they had been arersted because the tags were not the official plates. As a matter of fact, they were larger than is required and were made visible by electric lights much stronger than are ordinarily employed for this purpose. When Green explained that he was merely trying to go the limit in fulfilling the law the magistrate dismissed the case.

The Rock Island Automobile Club has been formed in the Illinois town of that name. The officers are: President, Joseph DeSilva; secretary, Charles E. Hodgson, Jr.; treasurer, George W. Reddig; executive committee, Walter A. Rosenfeld, W. E. Snider and J. T. Marron.

SMALL FIELD FOR VANDERBILT CUP

Only Five Entries for Classic Race and Eight for Grand Prix—Milwaukee's Far-Reaching Preparations.

Milwaukee and the Milwaukee Automobile Dealers' Association have aroused so much interest that its shrunken proportions scarcely will be remarked by those who witness the event, but the fact still remains that the Vanderbilt Cup race which will be run on Saturday, September 21st, is the smallest Vanderbilt which has yet been run. To date—and the entries close on Saturday next, 14th inst.—but five actually have entered the contest, although several tentative entries have been received. The Grand Prize road race, which is to be the curtain raiser for Milwaukee's speed carnival and which will be run on Tuesday next, 17th inst., can boast of but three entries more than the Vanderbilt contest, and rumors to the contrary notwithstanding the entries do not embrace the names of Boillet and Goux, the French drivers of Peugeot cars.

As if to bear witness to the fact that "good things come in small parcels," it may be stated that but few entry lists even in really "big" events are so free from the "lesser lights" as is the list of those who will contend in the coming Vanderbilt. Each of the five who are entered in the 298-mile grind—Ralph Mulford (Knox), Ralph De Palma (Mercedes), Hughie Hughes (Mercer), Spencer Wishart (Mercer) and Teddy Tetzlaff (Fiat)—has made a name for himself. With such a field and a course in prime condition for the full 8.725 miles, the contest, despite the limited field, cannot fail to prove interesting.

Hughes, De Palma and Tetzlaff also will drive in the Grand Prize road race, and the list is further augmented by the names of five others who are not unknown to fame. David Bruce-Brown (Fiat), Caleb Bragg (Fiat), Erwin Bergdoll (Benz) and Robert Burman (Benz), have already entered, as has Joe Dawson (Benz), whose appearance, however, is contingent upon the removal of his suspension by the contest board. The names of those who will drive in the smaller races for the Wisconsin and Pabst trophies have not as yet been announced; six cars have been nominated for the latter event and three for the former.

To ensure the attainment and maintenance of record breaking speed—and it confidently is expected by those who have to do with motor car racing that even the better than 78 miles an hour recently established by Theodore Tetzlaff on the Santa Monica course will be shattered during the Milwaukee contests—not the slightest detail has been overlooked in the reconstruction of the roads which are embraced in the course. The four long straightaways

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have been considerably widened and the whole road rebuilt from the coarse stone foundation to the fine top dressing, which has been rolled as flat as the proverbial "pancake." Wooden bridges and culverts have been replaced by more substantial structures of reinforced concrete. The four turns which are embraced in the rectangular course have been struck from as long a radius as is consistent with the lay of the land and, by way of ensuring the safety of the cars at these points, the width of the road on the turns has been increased to 80 feet. Equally important as the production of a smooth surface and a road wide enough to give the drivers sufficient "leeway" in passing one another, is the production of a surface which is free from dust, and to this end the course has been amply sprinkled with crude oil.

By way of keeping the course clear of the spectators for their own protection, as well as for the purpose of preventing interference with the performance of the drivers, fences and barriers which will hold the crowd back to a position nearly 300 feet from the roadway have been constructed at all points where such a measure was deemed practical or expedient. Insurance to the amount of $150,000 will be carried by the management to provide for possible mishap to those who are legitimately on the course, as well as the more than 50,000 who will occupy seats in the grandstand; the policies, however, do not cover accidents to persons not provided with regular ticket stubs. The course will be policed by detachments of state militia and local police officials, who will permit no one to enter upon the course who is not provided with a pass.

"PALACE CAR" ON TRUCK CHASSIS

Accommodates from 11 to 25 Persons in Pullman Style—Passengers Sleep, Eat and Enjoy Life on Tour.

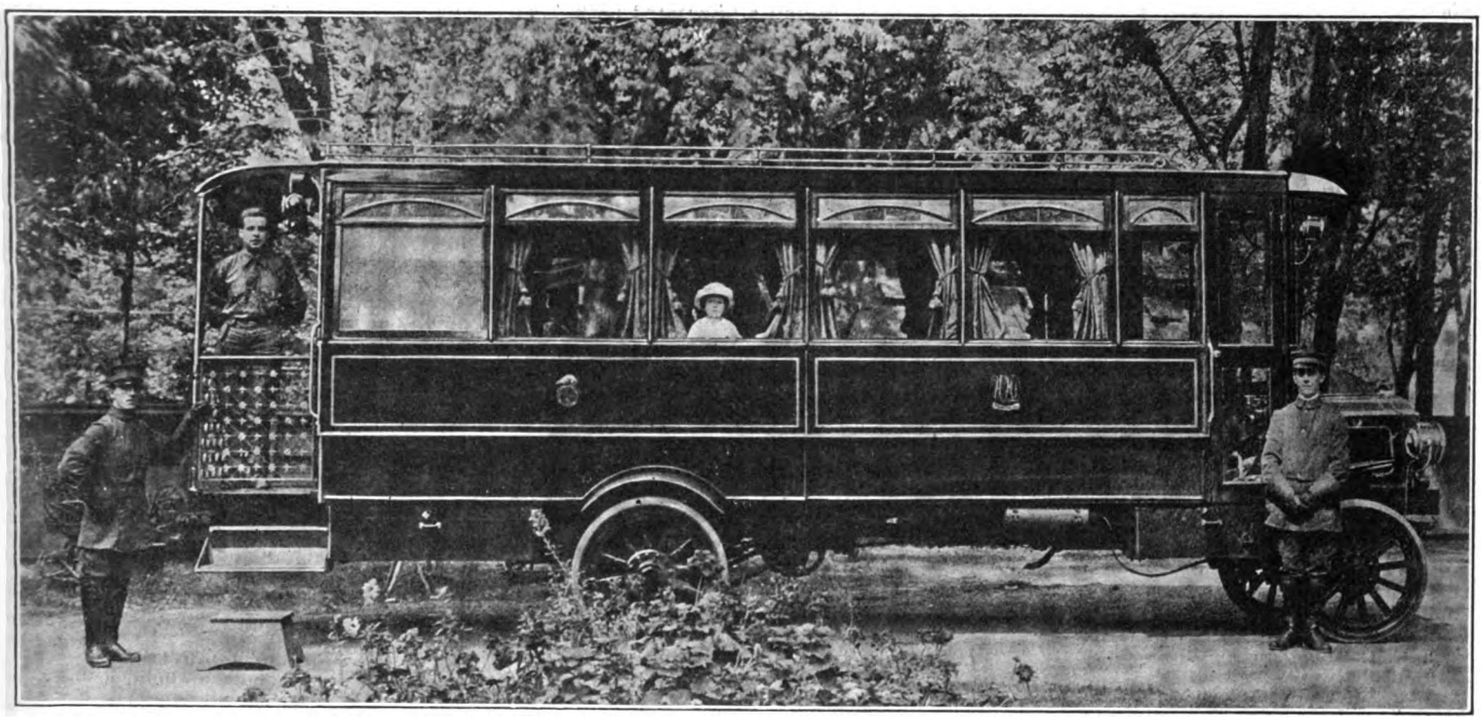
Variously arranged car bodies have been devised by motor car owners for purposes of cross-country touring, such vehicles generally providing some means for sleeping and dining, but it has remained for U. H. Dandurand, of Montreal, Canada, to go all predecessors one better and evolve a regular railroad Pullman car which assures luxury in motor travel, together with independence from hotels.

On a three-ton Packard truck chassis has been mounted a body whose interior arrangement is similar to that of a private railroad car. Twenty-five persons are easily carried on short trips, and for long journeys there are accommodations for the comfort of eleven, including chauffeur and cook.

The body is 25 feet 3 inches over all, 6 feet 6 inches wide, 9 feet 6 inches outside height, 6 feet 6 inches inside height. The compartments consist of a stateroom for the driver in front, a ladies' stateroom with sleeping room for five, a men's stateroom with quarters for four. This section is also the dining and smoking room, with two extension tables and a folding desk. In the rear is a kitchenette, compact and complete from stove to refrigerator. There is a telephone system with four instruments, placing every compartment in touch with the driver.

The interior finish is mahogany; the drapings of green silk and plush with gold lace trimmings, with Pullman carpets to match. The lighting system consists of a dynamo with two accumulators having a capacity of 160 amperes. The front of the car has six lights—two electric, two gas and two oil; the rear has a red tail light, an electric dome light and two railway signal lights.

Under the body floor are five lockers containing planks to reinforce weak bridges, blocks and tackle, and an entire touring emergency outfit. The body was built by P. Brault, Montreal. Special springs, designed by Packard engineers, insure easy riding. Mr. Dandurand, who is president of the Comet Motor Car Co., in Montreal, will go to Florida this fall with his family in his novel Packard Pullman and will spend the winter touring in the Southland.



CANADIAN'S IDEA OF A "PULLMAN" FOR USE ON THE PUBLIC HIGHWAYS

Lifting Magnets Made More Useful.

The tendency of the day in all branches of manufacturing is to increase the efficiency of all apparatus used, and a typical case is that of the Zenith Furnace, in Minnesota, which uses lifting magnets in conjunction with powerful cranes for handling pig iron. The magnets have broad, flat faces, and it has been the custom to let the pigs rest against the magnet horizontally. In the course of experiments, however, it was discovered that the work could be done quite as effectively by picking up the pigs by the ends. This plan resulted in just doubling the hoisting capacity, owing to the greater number of pigs that could be grouped in a given space, and the only additional cost was the slight charge for extra labor for piling the iron.

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1,015,482. Starting Mechanism for Explosive Engines. Orlando Ducker, Washington, D. C. Filed Oct. 10, 1910. Serial No. 586,348.

In engine starting mechanism of the character set forth, the combination of an air tank, a valved pipe connection between the air tank and the cylinder of the engine, a fuel supply pipe leading from the main tank containing the fuel in bulk connecting with the air pipe and adapted to deliver the fuel thereto in a minute jet, and an auxiliary fuel tank connected with the fuel supply pipe.

1,015,599. Pneumatic Tire. George R. Vaughan, Jefferson City, Mo. Filed Dec. 20, 1910. Serial No. 598,354.

A pneumatic tire including a plurality of separate inflatable sections placed end to end, nuts provided in the meeting ends of the sections, a coupling bolt detachably connecting the meeting ends of each pair of adjacent sections and having screw-threaded end portions engaging the nuts, the middle portion of each bolt being angular in cross section to engage with a wrench, and means removably mounted on the intermediate portion of each bolt for filling the space between the sections.

1,015,617. Variable Speed Gearing. Hugh William Fellows, Los Angeles, Cal., assignor to Fellows Direct Power Transmission Company, Los Angeles, Cal., a Corporation of Arizona. Filed June 23, 1910. Serial No. 568,549.

In a variable speed gearing, a plurality of intermittent grip devices, means for oscillating the same, means for controlling said intermittent grip devices comprising a toothed arm projecting from each intermittent grip device, a worm engaging said arm, a plurality of shafts extending slidably through the respective sprockets and turning therewith, and universal joints connecting the worms with the respective shafts.

1,015,623. Magneto. Sherman L. Kelly, South Bend, Ind. Filed May 5, 1910. Serial No. 559,530.

A magneto casing in sections with threaded extensions and rabbeted edges, and threaded caps engaging said extensions to hold the sections together.

1,015,649. Attachment for Vehicle Springs. George S. Spreyer, Canon City, Colo. Filed Apr. 16, 1910. Serial No. 555,806.

A device for repairing elliptical springs including an auxiliary spring consisting of a plurality of superimposed semi-elliptical leaves of a corresponding length and shorter than the said vehicle spring, the said leaves loosely bearing one upon the other and riveted together at their central portions, the terminal portions of the leaves being normally spaced apart so that when clamped together they form a resilient spring end, the upper of said leaves terminating at one end in an upturned extension and provided at its opposite end with an eye, and means adapted to bear on the upturned extension and passing through the eye for securing the ends of the auxiliary spring on opposite sides of the line of cleavage in the vehicle spring.

1,015,670. Bracket for Automobile Lamps. Benjamine F. Ensley and Clarence E. Ensley, Moulton, Iowa, assignors of one-half to Werter S. Farrar, Lincoln, Neb., and Leonard M. Clark, Moulton, Iowa. Filed Oct. 27, 1910. Serial No. 589,418.

An apparatus for automobile lamps comprising a hollow bracket with an enlarged upper portion having edge ball bearing sockets therein, the base of said enlarged portion provided with downward projections also having ball bearing sockets therein, a lever having an enlarged inner end mounted over the upper end of the bracket and provided with ball bearing sockets on its under face, said lever having an arm projecting into the bracket and having a plurality of nuts thereon, the upper one of which is provided with ball bearing sockets, said nuts adapted to clamp the ball bearing sockets together when the balls are arranged therein and said enlarged inner end of the lever having a bifurcated lamp holder projecting upwardly therefrom.

1,015,682. Suspension Spring for Vehicles. Louis Paul Constant Jules Jacquet, Neuilly-sur-Seine, near Paris, France, assignor to The J. M. Shock Absorber Company, a Corporation of Pennsylvania. Filed Oct. 21, 1910. Serial No. 588,344.

In an elastic spring support the combination of a hanger member; a bolt carried by said member; a casing closed at one end with a head through which said bolt passes and open at the other end; a spring in said casing; a U-shaped rod supporting said spring at its open end, and passing through said head near its looped end; a second bolt passing through said looped end; and a vehicle spring carrying said second bolt, substantially as described.

1,015,690. Automobile Tire. James E. Knauss and Charles Phinney, Healdsburg, Cal. Filed Nov. 7, 1910. Serial No. 590,988.

A tire comprising a continuous annular felly, a flange integrally formed upon one side of said felly, a sectional flange removably attached to the other side of the felly, a tread member transversely operable between said flanges, concentric resilient members yieldably supporting the tread upon the felly, and means for attaching the resilient members to the rim, said means comprising transversely extending bars passing through opposite ends of said resilient members.

1,015,698. Gas Engine Silencer. Hiram Percy Maxim, Hartford, Conn. Filed July 17, 1911. Serial No. 638,815.

The gas engine muffler comprising a series of partitions provided with central passages and having integral rims and enlarged flanges to co-operate with the rims of the adjacent nested partitions, an inlet to be connected with the engine exhaust and provided with a bridge, a bolt having a conical spreading end co-operating with said bridge, separators arranged between said partitions and provided with plates having central holes to accommodate said bolt and provided with spiral passages on both sides of said plates, said separators having less diameter than said rims and flanges to provide annular gas whirl chambers around said separators, a number of the separators adjacent the discharge end of said muffler being formed of stamped sheet metal and having deflectors arranged between the several separators between adjacent partitions to give increased muffling action, the surfaces of said spiral separator passages being roughened by a coating of fibrous asbestos on the inner surfaces of said annular chambers outside said separators.

1,015,750. Headlight. Richard H. Welles, Kenosha, Wis., assignor to The Badger Brass Mfg. Co., Kenosha, Wis., a Corporation of Wisconsin. Filed May 3, 1909. Serial No. 493,460.

In a lamp of the headlight type, the combination with a headlight casing, of a reflector seated therein, a burner mounted in the casing, self restoring mechanism movably and yieldably supporting said burner in its normal position, means for effecting a bodily shifting of the burner out of its normal position but within the ray field of said reflector, and operative connections extending from said shifting means to a distance from the lamp.

1,015,761. Resilient Wheel. Margaret E. Knight, Framingham, Mass., assignor of one-fourth to Anna F. Davidson and one-fourth to Beatrice M. Davidson, Saratoga Springs, N. Y. Filed Apr. 2, 1910. Serial No. 552,997.

In a resilient wheel, an axle-box adapted to turn upon the axle, a sleeve closely encompassing the said box and adapted to turn therewith, a coaxial sleeve of larger diameter spaced from and encircling the axle-box sleeve and normally concentric therewith, a spoke socket cylinder embracing the coaxial sleeve, a series of spiral springs within said space secured at their inner ends to said axle-box sleeve, and a spring retaining ring for the outer ends of said springs fitting within said coaxial sleeve and provided with holes countersunk on its outer surface through which the outer ends of the springs pass and are retained in the countersunk depressions.

1,015,767. Tachometer. Curtis Hussey Veeder, Hartford, Conn., assignor to The Veeder Manufacturing Company, Hartford, Conn., a Corporation of Connecticut. Filed May 1, 1911. Serial No. 624,439.

In an instrument of the character described, the combination of a common reservoir, a pump comprising a high speed part and a low speed part, both communicating with said reservoir, two indicator tubes for high and low speeds respectively and means affording passages whereby said tubes are placed in communication with said pump parts, respectively.

1,016,399. Ignition Device. John F. Cavanagh, Providence, R. I., assignor of three-fourths to Lindsley and Allen Electric Company, Providence, R. I., a Corporation of Rhode Island. Filed April 12, 1911. Serial No. 620,622. (Cl. 171—122.)

1. A combined spark coil and condenser mounting comprising in combination a coil having a primary and secondary winding, and a condenser, the leads from the condenser extending through the coil within the outer convolutions of the coil windings.

1.016,314. Starting Device for Internal Combustion Engines. Erle K. Baker, Chicago, Ill. Filed Feb. 8, 1910. Serial No. 542,703. (Cl. 123—180.)

In a mechanism for starting an internal combustion engine, a compressor adapted to be driven by the engine, the suction pipe of the compressor connected to the carbureter of the engine, a plurality of reservoirs for storing gas under pressure, a connection from the compressor to the reservoirs, a connection from each reservoir to a cylinder of the engine and a valve in each connection between the reservoir and the cylinder, substantially as described.

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Stewart Delivery Cars

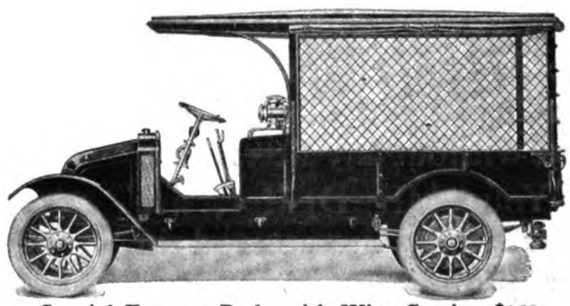
Sell Delivery Cars Built by Experienced Makers

The important factor in the success of the dealer in commercial cars is the kind of cars he has to sell. The kind of cars depends on the men who design and build them.



Panel Body—$150 Capacity—1500 pounds.

The **Stewart** delivery car is built by experienced motor car manufacturers. They were pioneers in the building of high-grade delivery cars of scientific design and careful manufacture. T. R. Lippard, president and general manager of the company, and R. G. Stewart, vice-president and chief engineer, are well known in the automobile world as practical, successful men and as the men who first saw the great possibilities for a light, good delivery car selling at a reasonable price.

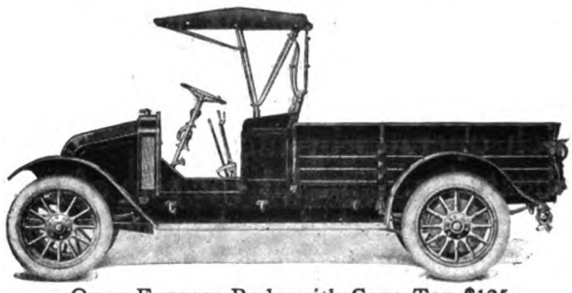


Special Express Body with Wire Grating $150
Chassis $1650. Capacity 1500 Pounds

The Stewart the Result of Careful Study

They have had long experience in the building and selling of both pleasure and commercial cars—they have an intimate knowledge of the needs and wants of all classes of merchants—they have made a close study of the most successful commercial cars in use—they designed, built and marketed the first high-grade, 1500 pound delivery car—and now they have put all the experience and ability gained from these various activities into their latest achievement, the **Stewart** delivery car.

Mr. Lippard and Mr. Stewart studied the situation carefully, they found out just what was needed, and they have built the **Stewart**, a car high-grade in every particular and having splendid features which will appeal to every intelligent buyer of a light commercial car.



Open Express Body with Cape Top $125
Chassis $1650. Capacity 1500 Pounds

The **Stewart** offers this striking combination of excellent features:

30 h. p. Continental Motor.	Center Control.
Timken Axles, front and rear.	Bosch Magneto.
Brown & Lipe Selective Transmission.	7-foot Loading Space.
Multiple Disc Clutch.	Roomy Body of new design.
Left Hand Steering.	Complications eliminated.

Send for our catalog and dealership proposition.

Stewart Motor Corporation, Buffalo, N.Y.

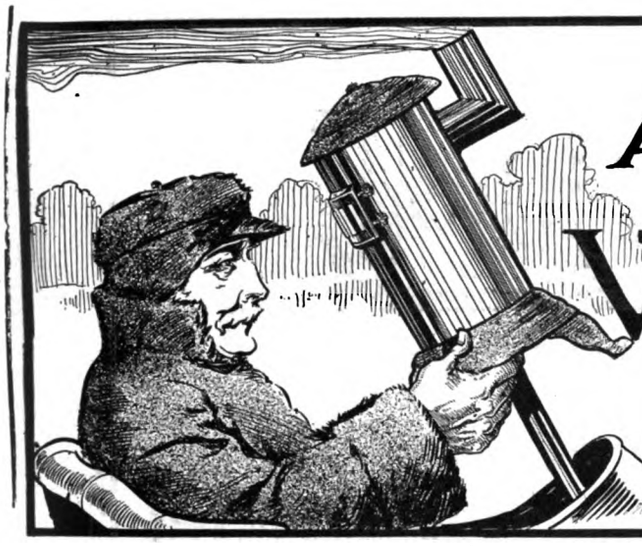
T. R. Lippard, Pres. and Gen. Mgr. R. G. Stewart, Vice-Pres. and Chief Eng.
R. P. Lentz, Sec. and Treas. R. W. Ingersoll, Sales Mgr.

Separate from and having no connection with the Lippard-Stewart Motor Car Company



Undertaker's Car $2200
Loading Space 7½ Feet Long

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A Nice Warm Stove in Your Hand

WITH the perfection of the Electric Warm Hand Wheel there is no longer any reason for driving under uncomfortable conditions in cold weather. For the Electric Warm Hand Wheel may be attached to any car in twenty minutes time without any alterations.

You, Mr. Dealer, are more vitally interested in our proposition than any other member of the industry. First, because the use of the Warm Hand Wheel, whether the electric or that which operates by means of preheated air, means the sale of more cars than ever before because winter driving becomes a pleasure rather than a hardship. Second, because the Electric Warm Hand Wheel offers a direct profit to you from the sale thereof.

The Warm Hand Wheel which is operated by preheated air is purely a manufacturing proposition, and it is up to the manufacturers who want to give the greatest refinement to their product to install Warm Hand Wheels on their cars. It is up to you dealers to plug for cars equipped with the Warm Hand Wheel because it means more money for you and an easier selling car.



Our campaign of advertising will create a big demand for the Electric Warm Hand Wheel, and it is up to the wise dealer to be ready to meet that demand. This Electric Warm Hand Wheel ready to install on any car retails for $10.00, and we will give you a good liberal discount. Don't wait until all of the choice territory is gone. Get in touch with us and reap the reward of being the first in the territory.

The Warm Hand Steering Wheel Company

527 Fifth Avenue **NEW YORK**

Patented April 23, 1907.
Patented Feb. 11, 1908.
Patented April 2, 1912.
} Other patents pending.

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The makers of Peugeot cars use our bearings. Still more famous have these Peugeot cars become this year by the winning of the French Grand Prix and the Mont Ventoux Hill Climb with Boillot at the wheel.

RHINELAND R·B·F Ball Bearings

Here are some foreign cars who use our bearings that have made history in the racing world:

PEUGEOT	LORRAINE-DIETRICH	ISOTTA-FRASCHINI
SCHNEIDER	CALTHORPE	BOLLEE
ROLLAND-PILAIN	MINERVA	HOTCHKISS
	HISPANO-SUIZA	

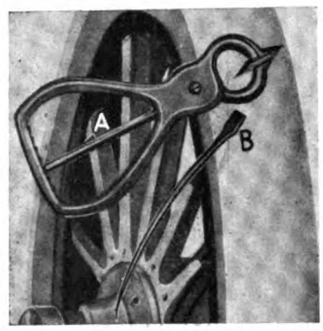
RHINELAND MACHINE WORKS CO.
142 West 42nd Street New York City



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Is your Customers Money slipping away like this?

GILMER TIRE-REPAIR PLIERS
PATENTED TRADE MARK



This illustration shows Gilmer Tire Repair Pliers (A) inserted in cut. The cleaner (B) enables you to free the cut or tear off all foreign substances.



This illustration shows the cut open wide so as to allow the rubber gum to be inserted clear down to the tire fabric.

Here is an accessory which sells for $1.00 that will about double tire mileage (and there's a good margin of profit in it for you, too).

Do you think you'll have any trouble selling quantities of these pliers?—for a dollar apiece?—when their use will absolutely double your customer's tire mileage?

Not only will Gilmer Tire Repair Pliers show you a nice profit from quantity sales but they will help you build up that army of satisfied customers you are striving to obtain.

Gilmer Tire Repair Pliers enable car owners to so greatly increase their tire mileage—because they make it possible for them to clean and repair the small cuts BEFORE they become blowouts.

Tires are rubber and rubber will cut. Seventy pounds pressure inside and two thousand pounds overhead plus the usual city street and country roads make cuts and tears a certainty. Just the second rubber is cut dirt, oil and grease are forced in at an alarming rate. They are all deadly poison to healthy rubber and a few hundred miles service will serve to poison the fabric, and a rotted fabric means a sure blow-out. Nine out of ten blow-outs are caused from little cuts to start. We are informed that 10,000 miles is built into every good tire. We believe it, for many Gilmer users have proven it.

To use Gilmer Tire Repair Pliers insert the prongs of pliers in the cut, pull lever and open cut to any desired size. The ratchet will hold the pliers open. Scrape out the dirt with the cleaner (free with every set of Pliers), insert a few drops of pure rubber gum. Withdraw the pliers and the action of the closing rubber forces the gum into place. You have a permanent repair, stronger than the original. The entire operation can be performed in two minutes.

Don't follow the leader—be the leader—get Gilmer Tire Repair Pliers FIRST in your town—they'll give you something new to talk about.

We have a mighty fine co-operative plan of selling and advertising for a few of the real, big, live dealers—we don't want you to do it all—write us and we'll tell you the inside details.

G. Walker Gilmer, Jr.
52 N. Seventh St. PHILADELPHIA, PA.

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$1000 REWARD

to the manufacturer, jobber, dealer or agent in the automobile trade who can produce or show us a motor driven horn now on the market of equal efficiency and quality to the *Newtone Superior* selling at our price — (listed at ten dollars.)

We claim to have the best motor warning device on the market at that price.

Eight years in the exclusive manufacture of auto signals — during which time we have made and sold over ***one million auto horns,*** and incidentally spent thousands of dollars in experimental work in perfecting our product — has made it possible for us to produce

Newtone Superior

The First Efficient Motor Driven Horn to Sell at a Popular Price

Made and guaranteed by the largest auto horn manufacturer in the world. It has no equal — no real rival.

1877 IN THREE DAYS AS OUR INITIAL SHIPMENT

As announced in our advertisements shipments were started promptly on August 15th. Every finished *Newtone Superior* went out of our factory on that day. An avalanche of orders has been received from all over the country. *Newtone Superior* has met with instantaneous success and we are proud of it.

CAR MANUFACTURERS — Include *Newtone Superior* in your 1913 equipment.
DEALERS — *Newtone Superiors* will sell three to one. You should be well stocked.

Shipments will be made as promptly as possible.

Automobile Supply Manufacturiug Co.

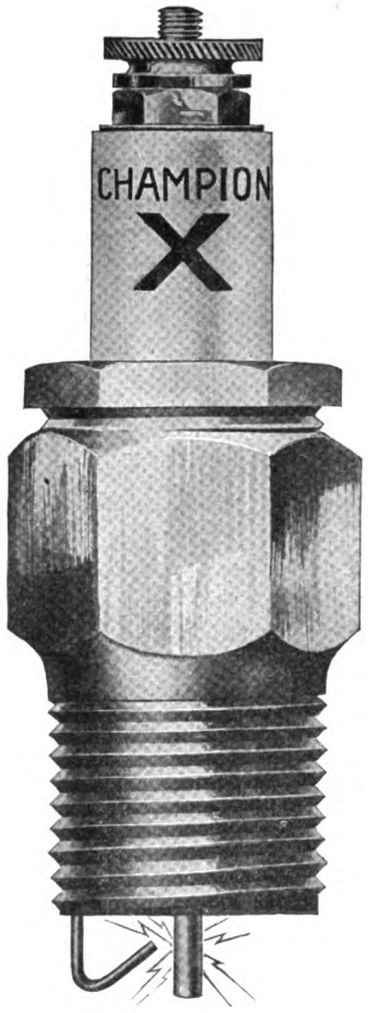
220 Taaffe Place **BROOKLYN, N. Y.**

Incorporated 1904

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TRADE-MARK

Champion Spark Plugs



CHAMPION X
75 Cents

WE find the greatest market for our product season after season of any spark plug manufacturers. It is the best recommendation we can give you for Champion spark plugs.

We can back up every one of these statements.

We have renewed practically every contract we held for the 1912 season. This is absolute proof of a consistent quality.

In this period Champion plugs furnished the spark for 60 per cent of the cars made in America. Twenty-five per cent of the makers called for our plugs.

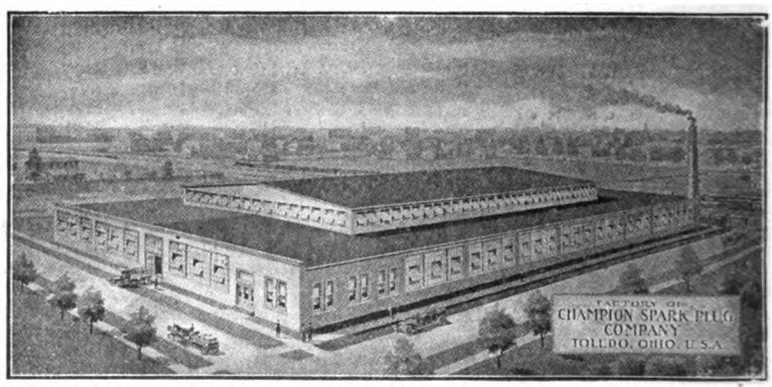
We are bound to make 3000 plugs daily in 1913 for one manufacturer alone. It is just one of the giant rewards which efficient plugs brought to us for this year.

What better references do Champions need?

Champion dealers who find a preference for one type are urged to send in others for exchange.

Owners watch for the Champion trade mark as above.

We invite you to write for our equipment proposition.



WHERE CHAMPION SPARK PLUGS ARE MADE IN TOLEDO

THE CHAMPION SPARK PLUG COMPANY, Dept. C, Toledo, Ohio

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The Largest Automobile Supply House in America

"THE INTERNATIONAL PROVIDER"

Orders from our 1912 Catalog have been received from the following countries:

England	Brazil
France	Venezuela
Germany	Uruguay
Russia	Argentine Republic
China	British Guiana
Japan	Dutch Guiana
Holland	Chili
Italy	Peru
Finland	Costa Rica
Portugal	Colombia
South Africa	Republic Dominica
India	Jamaica
Siam	British Honduras
Salomon Islands	Nicaragua
Malay Peninsula	Austria
Australia	Switzerland
New Zealand	Tasmania

And others too numerous to mention here.

Requests for our 1912 Catalog have been received from the following:

PIERCE-ARROW MOTOR CAR CO.
Engineering Department
PACKARD MOTOR CAR CO.
Engineering Department
TREASURY DEPARTMENT
Office of Secretary,
Washington, D. C.
AMERICAN CONSULAR SERVICE
Cartagena, Col.
AMERICAN CONSULAR SERVICE
Maracaibo, Ven.
DEPARTMENT OF COMMERCE AND LABOR
Bureau of Manufactures
DEPARTMENT OF THE INTERIOR
United States Indian Service
THE AUTOMOBILE CLUB OF AMERICA
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Los Angeles, Cal.
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AMERICAN LOCOMOTIVE CO.
BAUSCH & LOMB OPTICAL CO.
SCRANTON & LEHIGH COAL CO.
WALTHAM WATCH CO.
HOTEL ASTOR
And thousands of others.

Do You Want a Copy of Our 1912 Catalog No. 22?

The Most Complete of the Kind. Mailed Free on Request.

ATTENTION! Manufacturers of Automobile Supplies

We expect to begin work very soon on our 1913 Annual Catalog, which will have a circulation of over 100,000 copies all over the world. We will be pleased to have your proposition regarding handling and cataloging your line.

CHAS. E. MILLER Home Office 97-99-101-103 Reade St., N.Y. City

Manufacturer, Jobber, Exporter and Importer

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ATLANTA, GA.—66 Edgewood Ave.
PHILADELPHIA, PA.—318 North Broad St.
NEW ORLEANS, LA.—601-603 Baronne St.
NEWARK, N. J.—274 Halsey St.
SPRINGFIELD, MASS.—Bridge and Dwight Sts.

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"The Horn that's Made for the Discriminating"

TUTO HORN

THE TWO TONE HORN

A Gentleman's Signal.

THE TUTO horn has been characterized as a gentleman's warning signal by one of the most discriminating and progressive car manufacturers.

¶ Practically all of the cars of this concern are sold to discriminating users—people who are leaders in their community.

¶ By recommending and furnishing the TUTO horn, there is not a possibility that a bank president or other conservative car owner will be considered in the same class with the irresponsible person who periodically "paints the town red" by reckless driving and needless blast of an inflexible, one-loud-note electric horn.

¶ The owner of the TUTO equipped car always makes use of the low note for regular service, getting the way in a gentlemanly manner 90% of the time, yet this same horn can speak loudly in the case of emergency, and demand attention, when occasion requires a more powerful signal note.

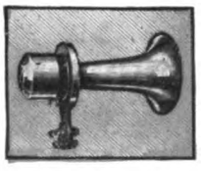
¶ Where the warning signal provides only one-loud-inflexible-note, always a nerve racking blast must be employed every time the button is depressed.

¶ Rather than insult friends and strangers by this loud demand, where one of much less power is sufficient, the discriminating car owner insists that the bulb horn be retained as part of the standard equipment of the car.

¶ This duplicating of the accessories complicates the operation and makes the efficiency of the signalling service so low as to be actually dangerous in the case of a real emergency, due to the possible confusion and the lack of time to think and act.

¶ The TUTO horn not only overcomes all of these difficulties in signalling, but the low note is effective 90% of the time and completely replaces the bulb horn. It is also a gentleman's request for the right of way for an ordinary occasion.

¶ The providing of a loud signal note by merely increasing the pressure on the one button, makes the TUTO horn 100% efficient and the best warning signal device to select as standard equipment.

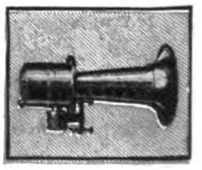


TUTO Horn, $25.00

The Dean Electric Co.

260 Taylor Avenue, Elyria, Ohio

"Look for Dean where Quality's seen"



TUTO-ETTE $17.50

Digitized by Google

R-C-H "Twenty-Five" $900

"The Car Complete"

F. O. B. DETROIT

The man who is in the market for a car at near the R-C-H price, and who does not buy an R-C-H, will not get equal value for his money, either in construction or equipment, anywhere else

N the first place, the R-C-H is built complete in our own great plants. The profits which makers of assembled cars pay to parts-makers are put into additional car-value in the R-C-H. The R-C-H introduced the left-side drive with center control and hand-brake in moderate-priced cars built in quantity. This increases the safety and convenience of automobile operation.

The R-C-H is exceptionally simple and easy for the beginner to learn.

The R-C-H has gained the nickname of "The Gum-Shoe Car" because it is so quiet.

Owners of R-C-H cars do not offend the public with clouds of smoke.

R-C-H cars are provided with large and small electric head lights. The strong lights, offensive to others, can be turned off on crowded thoroughfares.

They have soft toned "Tally-ho" horns that do not offend pedestrians like other shrieking signals. R-C-H Cars do not have muffler cut-outs, which are exceedingly offensive to owners of horses, pedestrians and other automobilists.

The R-C-H does not leak oil on the roadway when left standing.

The car is easy to start—easy to steer. The clutch throws out easily. Slight pressure on the brakes holds the car on steepest hills. The foot or hand accelerator is flexible, enabling the car to travel from three to forty miles per hour and taking easily the roughest roads and steepest hills.

The R-C-H is famous everywhere as the easiest riding car.

The R-C-H smooth body surfaces and clean cut chassis design make it the easiest car to wash and keep spick and span. R-C-H accessibility makes the car the easiest to repair, and repair bills the smallest.

R-C-H prices on repair parts are the lowest quoted by any automobile manufacturer in the world.

The R-C-H is a most economical car in gasoline and oil consumption and gets great mileage from tires.

The R-C-H body is most comfortable and affords greatest protection from wind, rain and dust. The doors are wide and front seats have dash ventilators. There is ample room for three adults in the tonneau, and plenty of room lengthwise so that there is no cramping of the limbs.

The R-C-H introduced the long stroke four cylinder motor in popular priced cars built in quantity. It has done much to demonstrate that a long stroke four has all the desirable qualities of a six-cylinder motor, without the complicated mechanism, extra weight and lack of economy.

The R-C-H introduced Jiffy Curtains—one of the greatest inventions for the motorist's comfort.

The R-C-H introduced non-skid tires all around as regular equipment on automobiles, thereby making motoring safer, reducing chance of puncture and prolonging the life of the tires. The R-C-H introduced the first high-grade speedometer ever used as regular equipment on moderate priced motor cars.

The R-C-H introduced the rich and durable red and black color combination as standard in quantity production of automobiles.

The R-C-H introduced the rear view mirror as regular equipment on automobiles, greatly aiding in the safety of automobile operation.

The R-C-H introduced the one-piece windshield, doing away with the useless lower glass and improving the vision.

The R-C-H introduced demountable and quick-detachable rims for moderate priced cars built in quantities .

The R-C-H is the chief exponent of high grade magnetos. More than 5000 Bosch magnetos now in use on R-C-H cars are giving perfect service.

The R-C-H introduced the straight-side, no-rim-cut tires—noiseless transmission gears—vibrationless motor.

The R-C-H has brought the moulding of gray iron to its greatest perfection. Over 5000 cars now in use have not produced one defective casting.

The R-C-H worked out the use of drop forgings to the greatest degree, adding greatly to the strength and durability of the car.

In over 5000 cars now in use in which are assembled one million drop forgings, there has not been one single case of defect.

Two Passenger Roadster, 110-inch wheel base, $900 f. o. b. Detroit.

Three Passenger Coupe, 110-inch wheel base, $1300 f. o. b. Detroit.

THE CAR

The best materials, the highest-grade workmanship, and the most up-to-date ideas in construction

Wheelbase—110 inches.

Motor—Long stroke; 4 cylinders cast en bloc; 3¼ inch bore, 5 inch stroke. Two-bearing crank shaft. Timing gears and valves enclosed. Three-point suspension.

Steering—Left Side. Irreversible worm gear, 16-inch steering wheel. Throttle control on steering column.

Control—Center Lever operated through H-plate integral with universal joint housing just below. Hand lever emergency brake at driver's right. Foot accelerator in connection with hand throttle.

Springs—Front, semi-elliptic; rear, full elliptic and mounted on swivel seats.

Frame—Pressed steel channel.

Axles—Front, I-beam, drop-forged; rear, semi-floating type.

Transmission—Three speeds forward and reverse; sliding gear, selective type.

Construction — Drop-forgings wherever practicable; chrome nickel steel used throughout all shafts and gears in the transmission and rear axle; high carbon manganese steel in all parts requiring special stiffness.

Body—Full 5-passenger English type; extra-wide seats.

EQUIPMENT

The most complete, highest-grade equipment ever placed on a popular-priced car

Non-skid tires—32 x 3½.

12-inch Hall Bullet electric head lights with double parabolic lens.

6-inch Hall Bullet electric side lights with parabolic lens.

Exide 100 Ampere Hour Battery.

Bosch Magneto.

Warner Auto-Meter.

Demountable Rims.

Extra rim and holders.

Tally-ho horn.

Jiffy curtains—up or down instantaneously.

Top and Top cover.

Windshield.

Rear view mirror.

Tool-kit, Jack, Tire Repair Kit, Pump.

Robe Rail.

Ride with us in this wonderful car and judge it for yourself. Demonstration by appointment at your convenience.

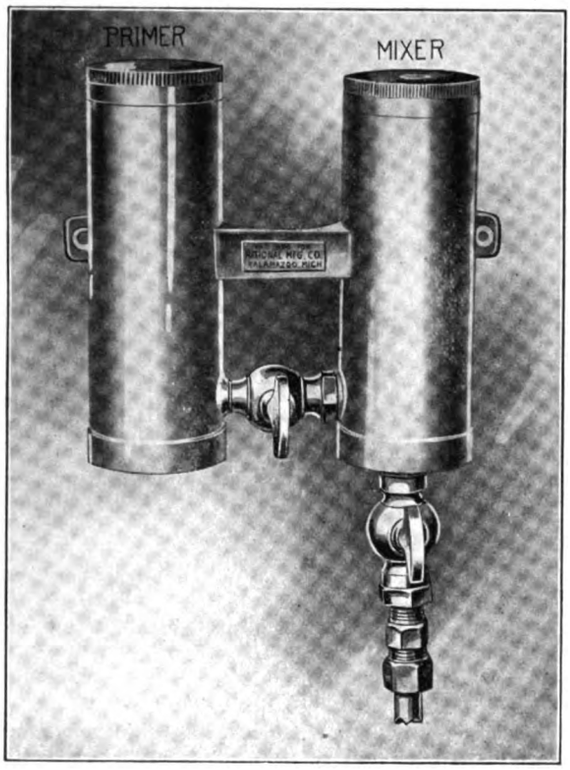
R-C-H CORPORATION, 104 Lycaste Street, Detroit, Michigan

Branches: ATLANTA, 545 Peachtree St.; BOSTON, 563 Boylston St.; BUFFALO, 1225 Main St.; CHICAGO, 2021 Michigan Ave.; CLEVELAND, 2122 Euclid Ave.; DENVER, 1520 Broadway; DETROIT, Jefferson Ave. and Lycaste St.; KANSAS CITY, 3501 Main St.; LOS ANGELES, 1242 South Flower St.; MINNEAPOLIS, 1206 Hennepin Ave.; NEW YORK, 1989 Broadway; PHILADELPHIA, 330 North Broad St.; SAN FRANCISCO, 819-835 Ellis Ave.; WALKERVILLE, ONT., CANADA.

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Saves 10 to 40% Gasolene—

Gives 10 to 40% More Power



Here is a device that every dealer can recommend, sell and guarantee. It is practical and does the work.

The claims are based on the conclusive experience of users.

The NATIONAL Compound Mixer and Primer

admits air to the manifold and thus breaks up and mixes with the right amount of air every drop of gasoline **before** it enters the cylinders. Does away with practically all carbon deposits. Instantly adds 10 to 40 per cent. more power and shows similar saving on gasoline.

Simply and Easily Attached

Any dealer can attach. Takes just about twenty minutes work. Our circular explains just how to do it.

The Priming Attachment

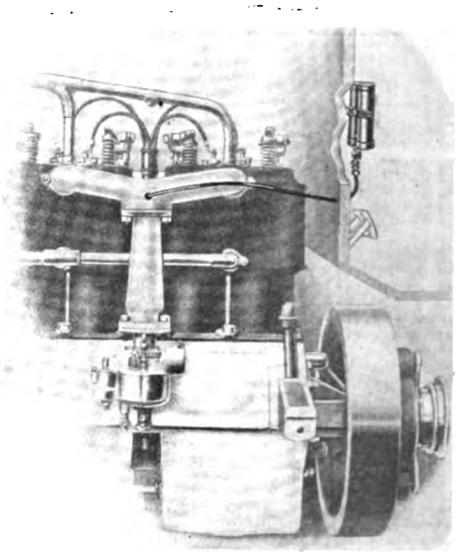
enables all cylinders to be primed at once by simply opening priming valve on the dash. As the gasoline is drawn from the primer into the cylinders, a quantity of air is taken with it from the mixer, thus insuring an explosive mixture This same priming attachment is invaluable for cleaning cylinders and valves.

FORD DEALERS
Take Notice

The priming attachment is great for Fords —No more taking out spark plugs to prime. One turn of a valve and all cylinders primed at once—more power, too.

Liberal Dealers' Proposition

Dealers, here is a self seller. Write at once for circular and letter giving information regarding terms, prices and open territory.



Controlled from the dash. Connects to the intake manifold at or or near the branch. Simply and easily attached.

NATIONAL MANUFACTURING COMPANY, Kalamazoo, Mich.

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A New Atwater Kent Ignition System WITH Automatic Spark Advance

This new system, known as the Type K, is noiseless and includes a method of automatically controlling the timing of the spark at any speed from three to seventy miles per hour.

The Type K System is practically silent—much more quiet than a magneto, and gives very much better results. Its efficiency, due to the construction of the contact maker and to the automatic advance, is higher than that of any other ignition device made.

The perfection of this automatic feature is the result of three years of hard engineering work to bring it to its present state of perfection, and we consider it the greatest step in ignition that has been made in several years.



For the last seven years, the Atwater Kent System has held its place as being unquestionably the best battery system in the world. During this time over **seventy-five thousand of our systems have been sold,** and practically all of them are in use to-day. They have not been sold because we coaxed people to buy them, but because one system has sold another.

During the period of the magneto fad, thousands of our friends who formerly used our system and *knew* what it *was*, discarded the magnetos on their new cars and put on the Atwater Kent, claiming they got much better results with much less trouble.

Our manufacturing facilities and reputation have been such that we could have taken advantage of the magneto craze and manufactured magnetos. We could, undoubtedly, have sold large quantities of them, but we knew that our system was better than any magneto that could be built and so stuck to it. As a consequence we know more to-day about battery ignition than any other manufacturer.

During the seven years that we have been manufacturing our system we have acknowledged that the magneto had the advantage of us on only one point—it generates its own current and therefore needs no battery, but to-day with the general adoption of electric lighting and therefore a plentiful supply of current from a dependable source which is available for ignition as well, what advantage has the magneto over our system? **Absolutely none!**—and on the other hand, **the Atwater Kent System has many over the magneto.**

This new Type K System has been our pet for over three years. Our whole engineering force has been working on it, making one model after another, perfecting, simplifying, cutting down cost of manufacture, and but few have known that we were working on it.

During the past year we have had our entire tool force making tools, fixtures, and machinery for producing this Type K in quantities. We have refrained from making any announcement until we had our factory in such shape that we could make prompt deliveries, realizing that it was useless to announce a good thing until we could give the public prompt delivery and satisfy the unquestionable demand.

The most wonderful feature of the new Type K System is the automatic spark control. A moment's thought will show that the setting of the spark should not be left to the discretion of the operator—at best, he can only guess the proper timing and even if he knew this definitely, he could not constantly shift his sparking lever to get the full efficiency of his motor at all speeds.

Our automatic spark control is really a self advancer and self-retarder. It begins to operate when the car is running at three miles an hour on the high gear and keeps the spark at precisely the proper position at the highest speed the car can possibly run. Below three miles an hour, the spark is at its proper position so that even though it were possible to run the car on high gear at two miles an hour or one-half mile an hour, the spark would always be correct. In the starting position the spark is properly retarded.

Another feature of the Type K System is that the primary circuit is not grounded, the contact maker being thoroughly insulated from the rest of the mechanism. This is of special value when the ignition current is taken from the lighting circuit.

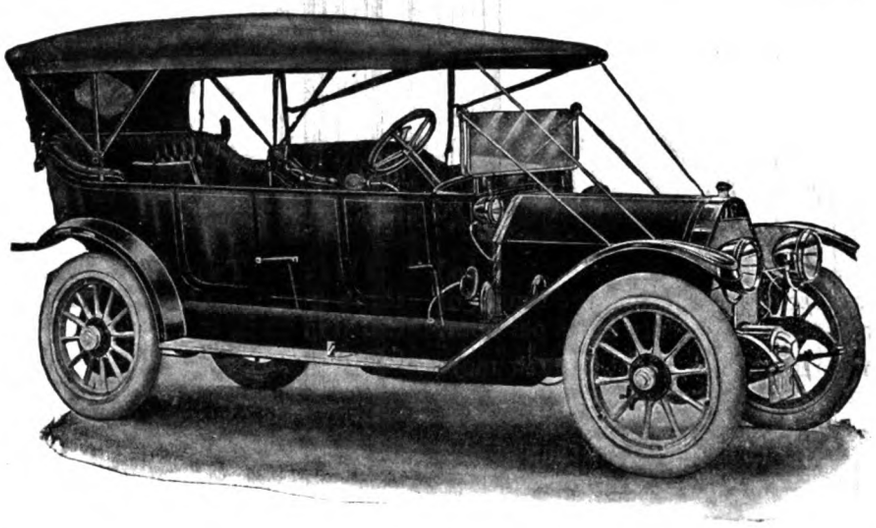
One glance at the Type K will convince you of its unquestionable superiority in workmanship and of its simplicity and sureness of operation. Every manufacturing detail that enters into this system is as near automatic as possible, so that all parts are interchangeable and absolutely perfect.

Write to day for further information, prices, etc.

ATWATER-KENT MFG. WORKS, 4937 Stenton Ave., Germantown, Pa.

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Pullman



Are You a 10% Dealer?

ANY dealer depending on his own effort will not average better than 10 per cent. of the possible sales in his territory.

A broad statement, but easy to prove. The 90 per cent. minus is the difference between INDIVIDUAL EFFORT and TEAM WORK.

The sale of AUTOMOBILES, that is, intelligent sales, require the same systematic and modern selling methods as applied to any other great industry. The individual must first be located before he can be sold, and how many DEALERS are *in touch* with the next purchaser?

In nine cases out of ten the PROSPECT starts "shopping" through the automobile district and YOUR LIVE PROSPECT is no secret; the other dealers know he is in the market and proceed accordingly.

Pullman Dealers Work Differently—They Know of the Prospect in Advance

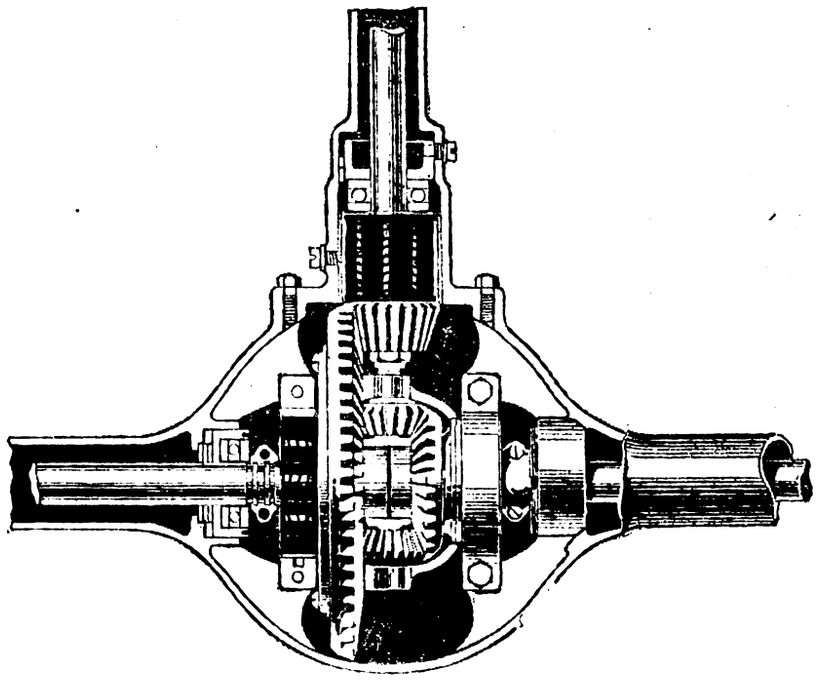
Back of every PULLMAN DEALER is the PULLMAN SALES MAKING MACHINERY (blue print on request), a wonderfully modern selling organization that spends many thousands of dollars to locate your prospect, to get you in touch. This plan is original with the Pullman Company. It's the final answer to successful distribution. In future years all AUTOMOBILE MANUFACTURERS will be forced to extend DEALER CO-OPERATION, just the same as the manufacturers of typewriters and sewing machines. The Pullman Company does it NOW. May we submit the selling plan? Three big leaders for 1913—all fully equipped and up to PULLMAN STANDARD.

4-36	4-44	6-66
$1675	$2150	$2750

PULLMAN MOTOR CAR CO., YORK, PA.

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FLEXIBILITY SAVES THE GEARS



SHOCK LOADS IN MOTOR CARS are enormous. Even ordinary speeds on average roads produce vibrations which would make any riding impossible without the use of springs, absorbers, etc.

NO PRINCIPAL MEMBER of the motor car even approaches a condition of absolute rigidity. An automobile bearing, then, whose successful operation depends upon accurate alignment of frame and shafts cannot give its best service under these conditions.

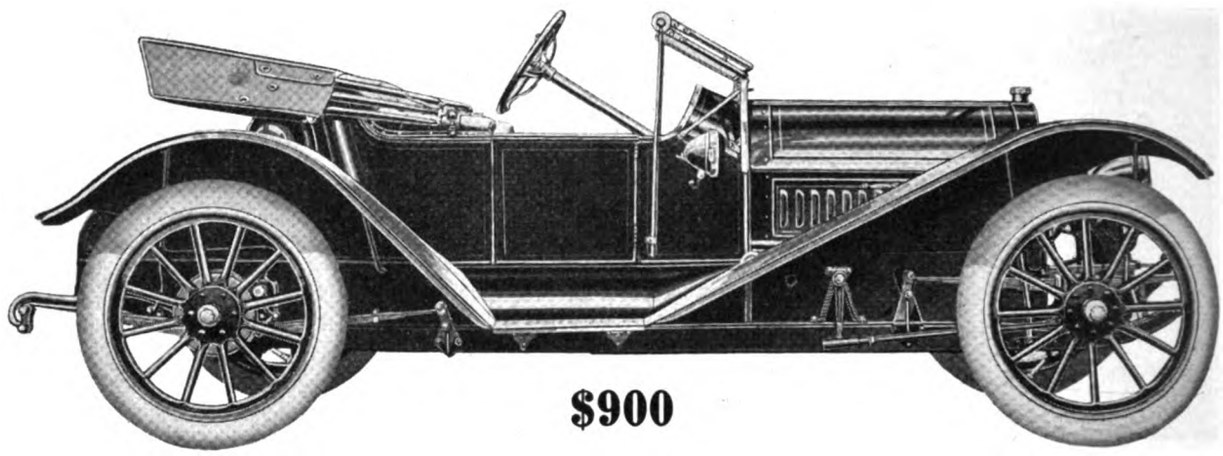
AXLE GEARS PARTICULARLY must be protected from the results of this rough usage. Any mounting which makes use of rigid bearings can only result in teeth unevenly worn, chipped or wholly broken off.

MIGHTY LITTLE FLEXIBILITY is in a solid ball or roller. The one bearing in which it really exists is the Hyatt. There the spiral rolls carry gears in accurate mesh under service conditions, at the same time cushioning shocks and relieving surrounding parts of excessive strains and stress.

HYATT ROLLER BEARING CO.
DETROIT, MICHIGAN

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THE "Roadster" which in sale and service has won the distinction of being the most popular car of its type in the country.



$900

The Regal Model "N" Underslung Roadster, "25" Horsepower

1913 Specifications

Read Carefully

Wheel Base, 108 inches; Tires, Morgan & Wright, 32 x 3½ inches; Selective Sliding Gear Transmission, three speeds forward and reverse; Motor, Four Cylinders, cast en bloc; Bore 3¾ inches; Stroke, 4½ inches; Dual Ignition; Thermo Syphon Cooling. Equipment includes nickel-plated trimmings; Electric Lights, with option of gas headlights, and Prest-o-Lite Tank; Electric Horn; Tools and Tire Repair Kit. Top, Windshield and Speedometer, $75 extra. Price $900.

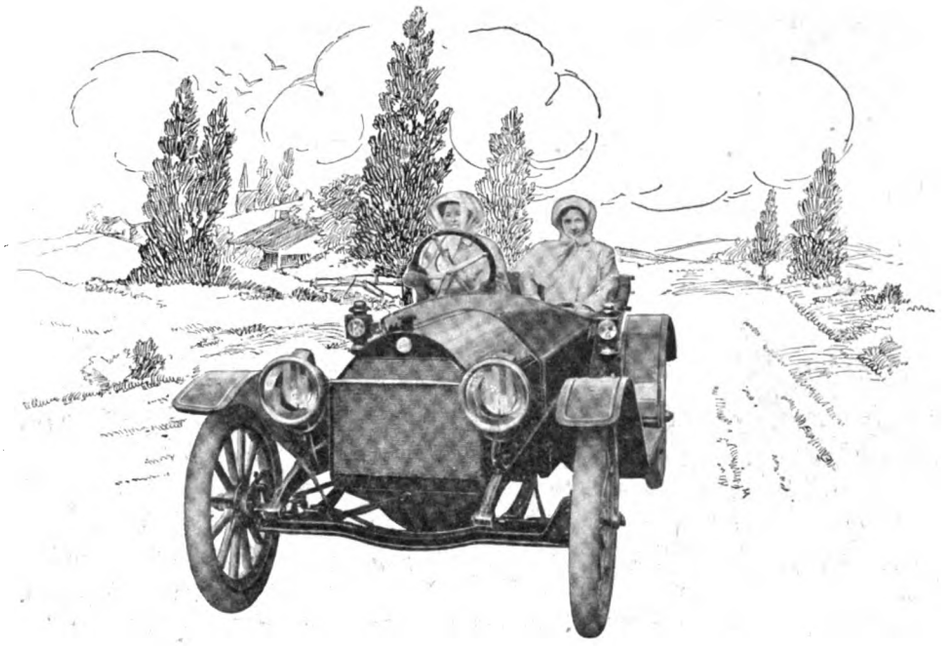
Classification

¶ There is an inbuilt beauty of line, a practical comfort, an assured record of enduring quality about this car which cannot be denied. It has broken many road records, outsold every other Roadster at its price or over, and rendered a satisfaction to every owner which assures a well earned prestige for 1913.

Wire or Write

The Regal Motor Car Co. **Automobile Manufacturers** **Detroit, Mich.**

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Count on Us for Sure Delivery

For the Halladay representative the 1913 season will have no delivery problem. Our trade connections can safely assure their customers of absolutely certain delivery, if they apply promptly for their allotments. Our added facilities and amply enlarged resources enable the dealer to depend positively upon timely delivery and adequate service for the

Halladay for 1913

A SUPERB variety of models to suit any buyer's fancy, as well as prompt delivery, are the strong Halladay arguments for the 1913 season. The Halladay, with its three chassis (32, 40, and 6-50) and seven models, priced at $1,200, $1,800 and $3,000, provides a showing that outranks comparison with cars listed at twenty per cent more money! Compare the Halladay! Then admit that it is exactly the car YOU want to represent.

READ the catalog now ready for YOUR examination. Or see the Halladay and admire the dominating quality of its special features—Double Drop Frames, insuring stability and balance; big, roomy Tonneaus with luxurious upholstery; Full Electric Light Equipment, and an Electric Self Starter that is positively efficient; amply-powered long stroke Motors; excess size Goodyear No-Rim Cut Tires on Demountable Rims; complete detail equipment—no extras needed.

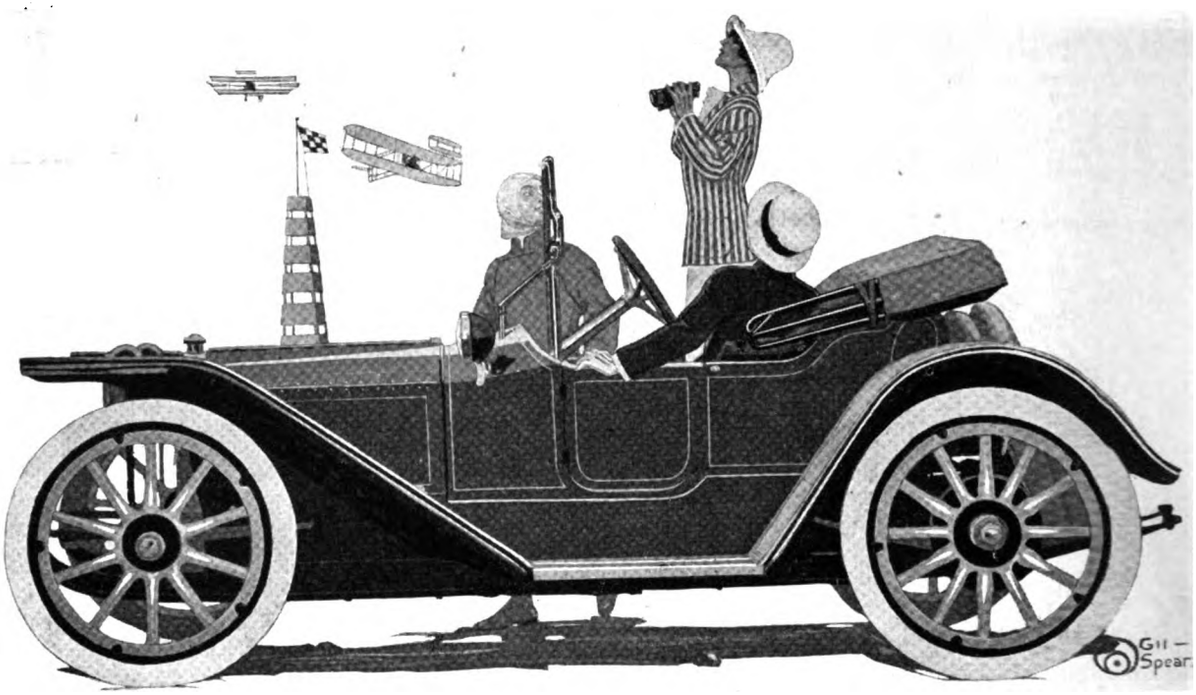
Our Plant Now Covers Nearly 11 Acres Under Roof
Output Will Double Last Year's - Ample Funds to Build It
Get in Correspondence with Us Immediately

STREATOR MOTOR CAR COMPANY

STREATOR - - - - - - - - - - - ILLINOIS

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Actual sales gain last fiscal year over preceding year—183 per cent.
Actual sales gain first month this year over same last year—200 per cent.



Self AMERICAN UNDERSLUNG *Starting*

The American Scout (Type 22A)—$1475
Fully Equipped

Strictly a two-passenger car. Motor four cylinders, 5 inch stroke, 3¾-inch bore. Wheel base 105 inches; tires 36x3½-inch front and rear on Q. D. demountable rims.

$1475 includes regular equipment as follows: $50 Warner speedometer; fine plate glass wind shield; Disco self-starter; electric dash and tail light supplied by a large storage battery; gas head lights supplied by Prestolite gas tank; fine mohair top and curtains; high tension magneto and storage battery with coil; one extra rim; combination circular tire holder and luggage box; horn; jack, tools and tire repair outfit.

Enjoyment in a Small Car

THE "American Scout" is as perfect in mechanical action as in appearance. Enthusiasm, joy and comfort come with the "Scout." There is not a care or worry left about it. You dash over the country hills at 40 miles an hour or creep silently through heavy city traffic at four miles without shifting gears. There is always that responsiveness at the throttle which makes you glad

The "American Underslung" design destroys all jolting and jarring. There is none of the teeter-totter motion of ordinary runabouts and roadsters. In it are blended all the qualities of the big, luxurious touring car at several thousands. And in contrast there are no large up-keep bills.

The "American Underslung" principle makes possible additional *safety*, *economy* and *comfort*,

The low center of gravity means *safety* and *added comfort*.

The straight line drive means *less wasted power*.

The larger wheels mean *easier riding*, *tire economy* and *maximum road clearance*.

The "American Underslung" frame permits the direct and practical introduction of all these distinct and exclusive advantages.

The "Scout" is priced at $1475 and comes fully equipped. All of this equipment is listed above. The "American Underslung" accessories for 1913 are the very finest made.

We have increased the "Scout" production of our output greatly this year. It is being snapped up by dealers from coast to coast. If you will wire or write us at once, we can save you an allotment.

The "American Traveler" (Type 56A) Fully Equipped $4800

Six passengers. Motor, four cylinders, 5¾-in. bore, 5½-in. stroke. Wheel base 140 inches; tires 41x4½ inch, front and rear on demountable rims.

$4500 includes regular equipment as follows: combination electric lighting dynamo and self-starter, all five lamps electric ($350.00 outfit); $90 Warner clock combination 100 mile speedometer; fine plate glass wind shield; fine mohair top and curtains; high tension magneto and storage battery; two extra rims; shock absorbers; foot rest, robe rail, horn, jack; tools and tire repair outfit.

The "American Tourist" (Type 34A) Fully Equipped $2350

Four passengers. Motor, four cylinder, 4½-inch bore, 5-inch stroke. Wheel base 118 inches; tires, 37x4 inch; front and rear on Q. D. demountable rims.

$2350 includes regular equipment as follows: electric light dynamo and complete with generator and storage battery supplying five lamps; $50 Warner speedometer; fine plate glass wind shield; Disco self-starter; fine mohair top and curtains; high tension magneto and storage battery; one extra rim; shock absorber; robe rail, horn, jack, tools and tire repair outfit.

American Motors Company, Dept. E, Indianapolis, Indiana

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King George V, of England, Expresses Appreciation of Wire Wheel Equipped Sheffield-Simplex Car

That English Royalty appreciates the merits of smooth, easy riding is shown in a testimonial written by order of King George V, when he was Prince of Wales, to the Sheffield-Simplex makers complimenting them upon the smooth running of the car and the ease with which it negotiated hills.

Of course this has no bearing upon the great tire saving qualities of wire wheels over wooden wheels, but it does emphasize our claims of easy and smooth riding, greater acceleration and saving of engine life.

70% MORE TIRE MILES

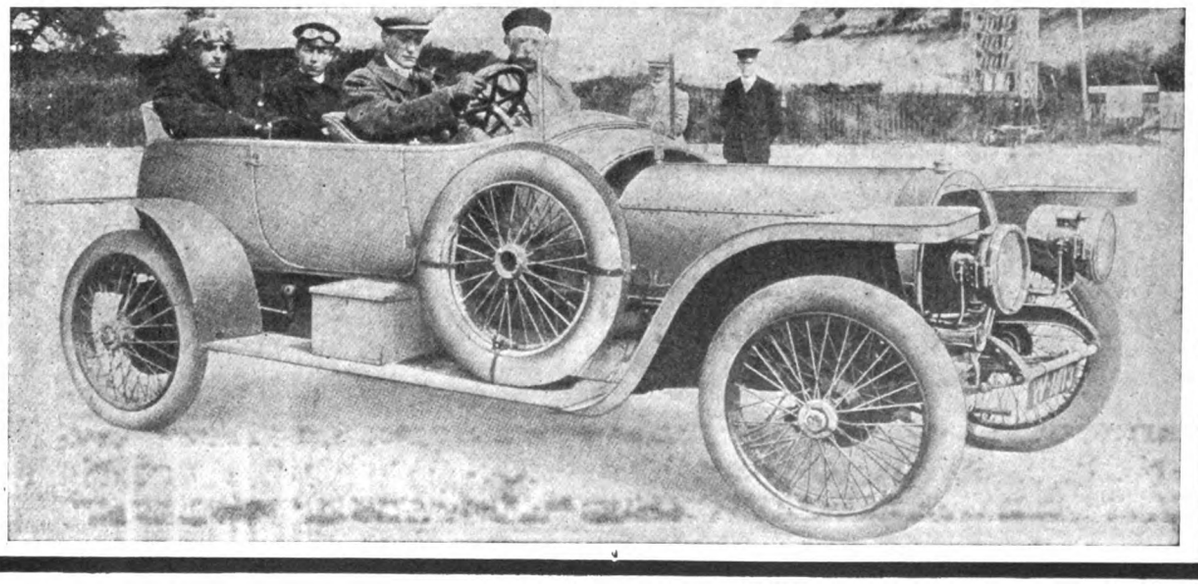
WIRE McCUE WHEELS

This same car was able to climb from one end of England and Scotland to the other on high gear, a feat probably never duplicated by an ordinary stock touring car. Wire wheels figured prominently in the performance of this feat.

Wire wheels are not limited in their functions to any class of car or to any class of work. They save tires and save cars wherever they are used, and abroad their superiority is absolutely an admitted fact both for racing and for ordinary usage.

They will soon be so regarded in this country.

THE McCUE CO., Buffalo, N. Y.



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JENCICK

QUALITY MOTORS FOR HIGH GRADE TRUCKS



The average truck manufacturer gives his customer a definite tire mileage guarantee—but he is often modest in the matter of giving the engine good clearance papers.

And just because the engine is built to get said manufacturer and his dealer over to the sunny side of Profit street, generally demonstrates its future usefulness (?) in a mighty emphatic way—to the man who buys it.

The Jencick engine makes good—it offers more real selling points than any engine ever installed on truck or pleasure car.

It gives service that eliminates bearing and shaft distortion, cylinder wear, crank shaft trouble, lubrication inefficiency and minor troubles that shorten the life of the average motor.

Jencick bases are made from manganese bronze — crank shafts from Krupp chrome steel—cylinders and pistons from semi-steel — annular and ball bearings whenever possible—but that is a long story.

Engineering practice in original design, takes this out-of-ordinary material and moulds it into a motor that is radically different and better than any truck motor of to-day. Your investigation will prove this.

Such an engine costs money to produce—and for that reason we make no attempt to meet the prices of the makers of ordinary engines—we want to do business only with truck builders who know that present and future demand for service trucks is and will be imperative—and that money spent for a practically indestructible power plant is a good advertising investment.

Your investigation will make you seriously consider this—the final evolution of the modern internal combustion engine.

JENCICK MOTOR CORPORATION, PORTCHESTER, N. Y.

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COMING!!!

STANWELD
RIMS

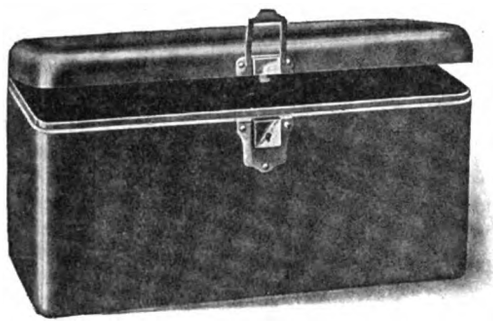
THE
STANDARD
WELDING
COMPANY
CLEVELAND

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HAYES MF'G. CO.
HAYES
DETROIT, MICH.

Foiled Again!

Your tools are safe from the petty thief if you have a "Hayes" box with a "Hayes" special lock which only YOUR key will open. They are made the same as "Hayes" safety deposit boxes—of pressed steel, electrically welded, and are absolutely burglar proof.



Beautifully finished (enamel baked on), they do not chip, but hold their gloss indefinitely. "Hayes" boxes come in 26 standard sizes, fit any running board, are made with or without compartments or trays, and are now used on more than a quarter million automobiles.

Add one of these well-finished, useful boxes to your running board so that your tools and spare parts will be instantly accessible without disturbing the occupants of the car. And be sure it's a "Hayes," because "Hayes" quality is a good selling point. The Hayes factories are the largest users of sheet metal in the world.

You can get a "Hayes" box for any purpose—for Prest-O-Lite tanks, batteries, tools, etc. Prices from $3 to $12.



Garage Floor Pans

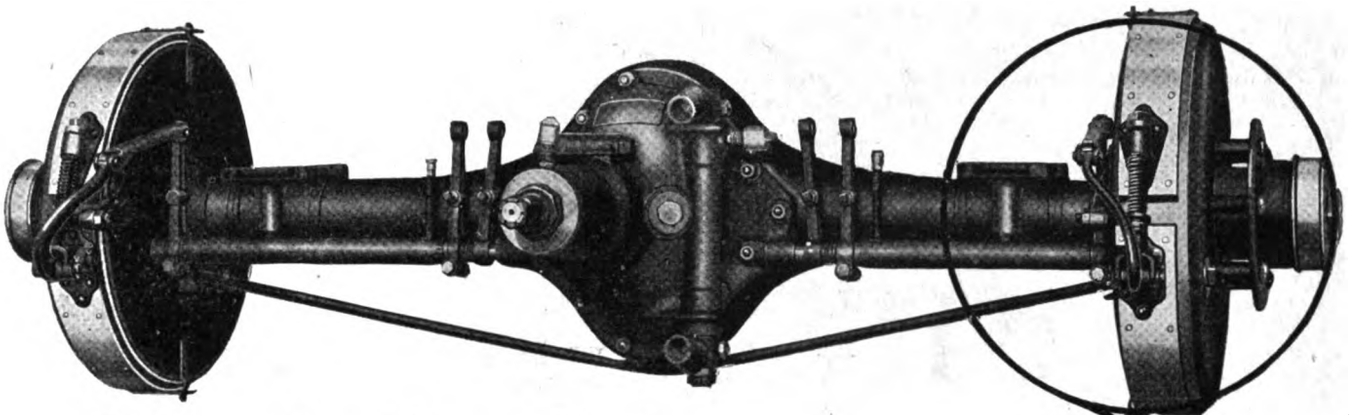
Keep your garage floor clean with a "Hayes" floor pan to catch the grease and oil. They save tires and keep things spick and span. Price, $2.

Better get in touch with Hayes today.

HAYES MANUFACTURING COMPANY

Detroit, Michigan

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Like the Jewels in a Watch

So are the bearings in the axles of a motor-car.

As the jewels are necessary for lasting service and year-after-year accuracy in a high-grade time-piece—

So good bearings are the prime service-essentials in the axles that are to carry you in safety and comfort during the life of your car.

TIMKEN
BEARINGS & AXLES

Rear Axle Bearings Must Do Far More Than Cut Down Friction

1. At the axle-ends in the wheels they have to carry the load and stand all the shocks due to roughness of travel.

Roller Bearings do this along the whole length of their rollers.

2. They must stand end-thrust—present at every turn.

Tapered Rollers do this because they revolve at an angle to the shaft.

3. At the differential and the driving-pinion they must keep shafts in line and hold gears in perfect mesh as well as carry vertical and end-pressure.

Timken Tapered Roller Bearings do *all* these things—and do them *all* the time—

Because they are adjustable.

When the minute wear comes that is inevitable in any rotating parts, that wear can be completely taken up by merely advancing the cone farther into the cup. Then the bearings are just as good as new.

A Good Rear Axle Must Meet Four Great Service Tests

1. The rear axle must carry more than half the weight of the car and its load.

The Timken-Detroit is built for strength—plenty of strength and then more to make sure—without useless weight.

2. The rear axle is next to the road and gets all the jar and vibration.

This necessitates the careful construction which, in a Timken-Detroit Axle, extends even to the grinding of hundreds of separate pieces of steel to an accuracy of less than the thousandth part of an inch.

3. The rear axle must deliver maximum power from the engine.

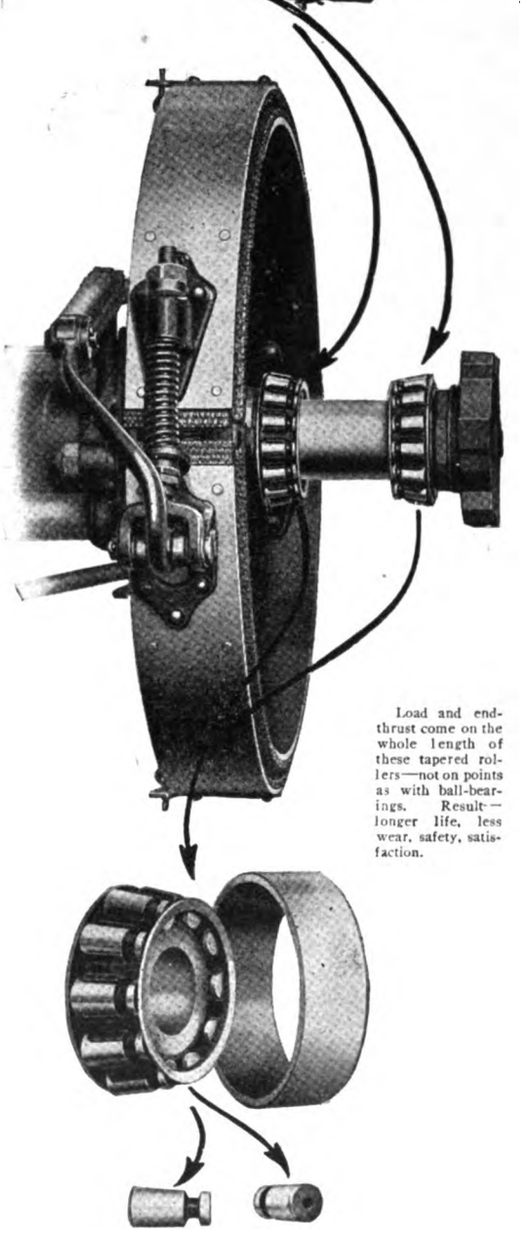
The accuracy of Timken-ground gears; the long life of Timken bearings; the unit-construction of the entire driving-plant—all work to this result.

4. Through its brakes the rear-axle takes up the stresses of stopping the car.

Timken brakes hold like a vise, but stop the car without chatter or jolt.

No matter how good a rear axle is, it is not good enough without the best bearings.

You can get the whole story of axles and bearing importance and construction by writing to either address below for the Timken Primers. T-5 "On the Care and Character of Bearings," and T-6 "On the Anatomy of Automobile Axles."



Load and end-thrust come on the whole length of these tapered rollers—not on points as with ball-bearings. Result—longer life, less wear, safety, satisfaction.

The rollers are held in position by a pressed-steel "cage" and revolve about a hardened steel "cone" having two ribs which keep rollers in alignment. By advancing the cone in a Timken Bearing, just a little, the minute wear is wholly corrected.

THE TIMKEN ROLLER BEARING CO.
Canton, Ohio
THE TIMKEN-DETROIT AXLE CO.
Detroit, Mich.

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Knox

Commercial Vehicles
WIN THE CONFIDENCE OF THEIR OWNERS



FACTORIES
Wordham, N.Y.
ROLLING MILLS TIN PLATE WORKS AND FOUNDRY
Harrisburg Pa.



BRANCH HOUSES
Chicago Boston

L & G Mfg. Co TRADE MARK

Lalance & Grosjean Mfg Co.

CABLE ADDRESS "AGATECLIFF" NEW YORK

200 BROADWAY New York. May 24, 1912.

Knox Automobile Company,
1966 Broadway,
New York City.

Gentlemen:-

In reply to your inquiry asking for an expression from us as to our experience in the use of your motor trucks, would state that the fact that we have just placed a new order with you for six 4-cylinder, Model "R-15", 3 ton trucks, should be sufficient evidence that our experience with your trucks in the last five years had been most satisfactory.

We have used Knox motor trucks exclusively for over five years and as we have used no other make, can give no comparison as to the efficiency, up-keep, etc., but it is sufficient to state that our experience with your machines has been so satisfactory we have just placed with you the above order. Our experience with your machines and the courtesies extended by your company have been so satisfactory that we take pleasure in adding our testimonials to the many others you already have.

Very truly yours,
LALANCE & GROSJEAN MFG. CO.

J.H.W./B. President.

Send for Catalogue "W"

KNOX AUTOMOBILE COMPANY, Springfield, Mass.

New York — BRANCHES — Chicago

"Recognized as America's Highest Standard Since the Beginning of the Industry"

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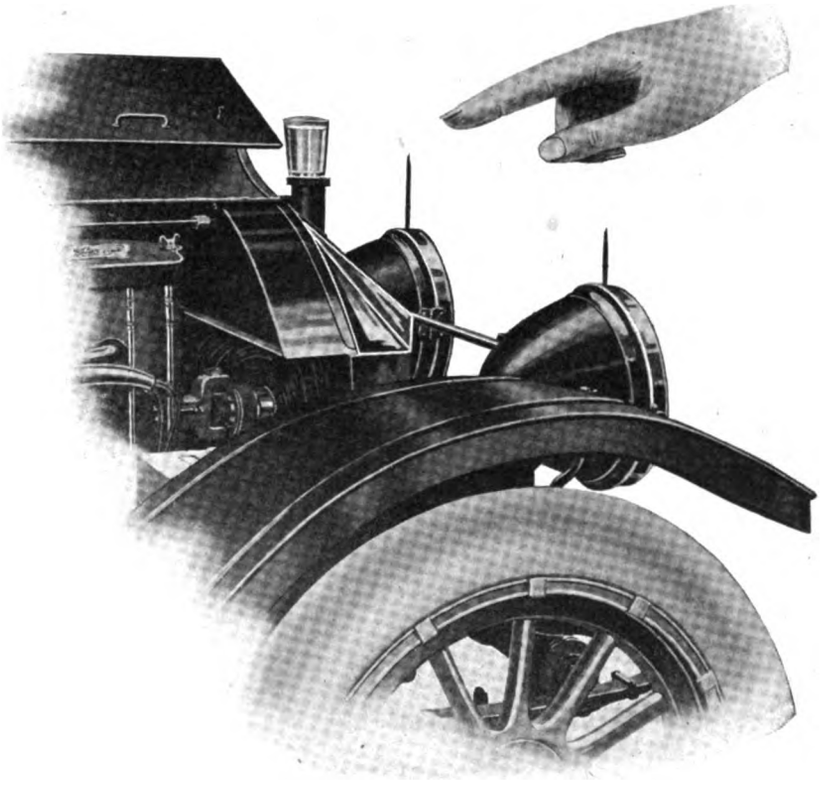
Knox

"Little Six"—The Balanced Car

Aside from its ample reserve power, unexcelled flexibility and rare beauty of design and finish, the new Knox "Little Six," Model 46, embodies many features which mark a new epoch in Motor Car refinement.

One of these highly desirable qualities is correct balance and absence of disagreeable vibration, a result toward which automobile engineers have been striving for years; incorporated as one of the quality "ear marks" of Knox Model 46.

As proof of the above statement we call attention to the following cut showing two pencils balanced on the headlights and a glass of water on the radiator cap with the motor running, taken from an actual photograph.



This is the most exacting test of balance that could possibly be imposed, and proves the thoroughness with which every detail of 1913 Knox cars has been worked out.

Ask for a demonstration of this convincing test at your first opportunity.

Send for Advance Folder of 1913 Models

KNOX AUTOMOBILE COMPANY, Springfield, Mass.

New York—BRANCHES—Chicago

"A Demonstration is Irresistible"

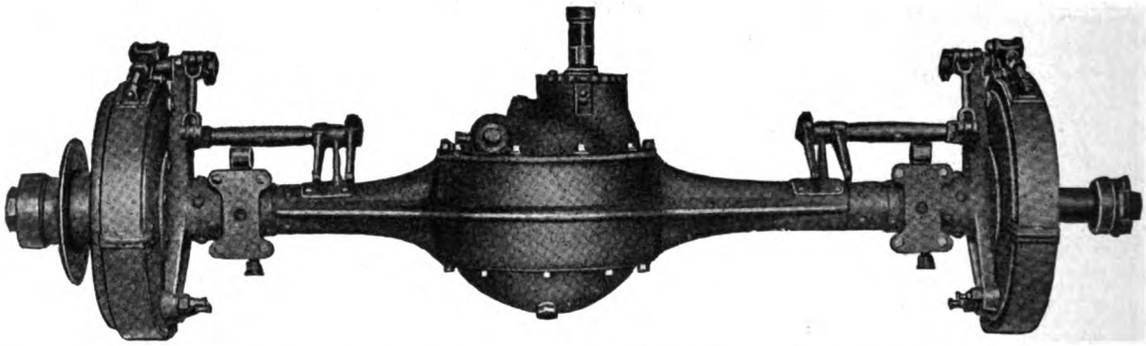
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American

American

You will not waste your batteries fighting unnecessary friction if your electric has

American Axles



Whether you select the Bevel Gear—first made by us for electric vehicles—or the Worm Gear, your batteries will send the maximum of energy to the driving wheels of your car if you use *American Axles*.

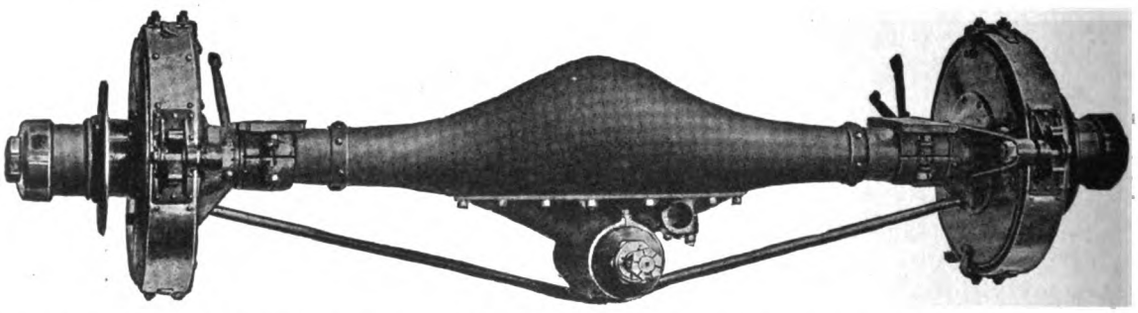
The patented features of these axles give you a greater return in service than is possible with axles less accurately designed and manufactured.

"Service," in this connection, literally means mileage—the extreme distances made possible by the minimum of power absorbed by frictional causes.

This is why the supreme quality of *American Axles* represents real economy to their owner.

And this is true whether your choice is for Bevel or Worm driven axles.

In either case *American* means Best, because we hold the exclusive rights in this country to the manufacture of the Lanchester-Daimler Worm Gear as applied to axles, the worm gear which is recognized here and abroad as having no serious rival in its class.



THE AMERICAN BALL-BEARING CO.

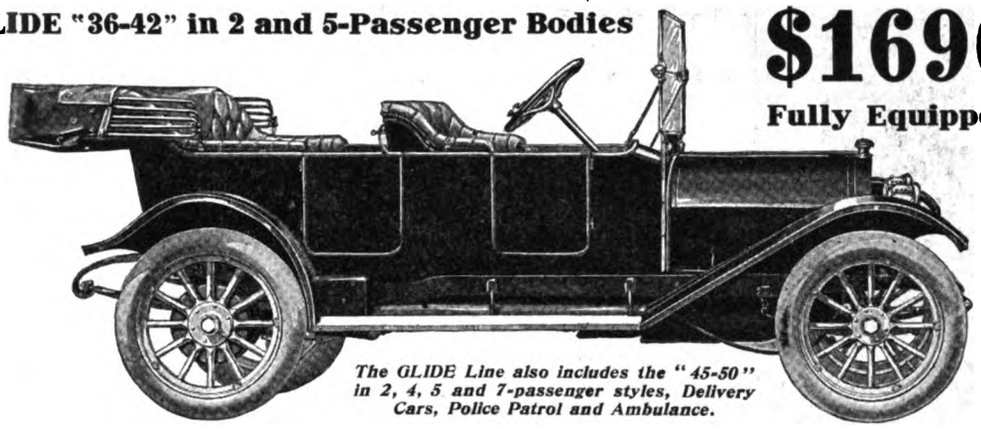
Edgewater Park and L. S. & M. S. Ry. CLEVELAND, OHIO

American

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GLIDE "36-42" in 2 and 5-Passenger Bodies

$1690
Fully Equipped



The GLIDE Line also includes the "45-50" in 2, 4, 5 and 7-passenger styles, Delivery Cars, Police Patrol and Ambulance.

The *Popular* QUALITY Car

THE GLIDE "36-42" is strictly a QUALITY car—only the best known quality of materials has been used.

The GLIDE is a pleasure car—not a worry wagon. The great strength, simplicity and accessibility of all its working parts enable you to leave your worries behind.

Latest Equipment

The new Motor-Driven Tire Pump saves your strength, your time, your temper. Also saves your tires by keeping them fully inflated.

The Electric Lighting System is another of the GLIDE'S high-class features. Simply touch a button.

Electric Bull's Eye Side Lamps are sunk in dash, adding to the GLIDE'S appearance, eliminating all rattling and minimizing chances for breakage.

The GLIDE Self-Starter is sure of a spark, regardless of whether the points of the magneto are together or not.

Center Control, Left Side Drive, Floating Rear Axle with Pressed Steel Housing. Baker Bolted-on Demountable Rims, Goodyear No-Rim-Cut Tires are all found in the 1913 GLIDE "36-42."

The GLIDE Price

enables you to own a highest-class, top-quality car without paying enormous and unreasonable profits.

No other car gives you the up-to-date, efficient, luxurious GLIDE equipment, together with GLIDE structural quality and GLIDE service—at anywhere near the GLIDE price.

Write NOW for detailed descriptive circular.

Dealers

A GLIDE agency will be worth thousands of dollars to you. Open territory can be obtained NOW upon very attractive terms. Don't let this exceptional opportunity slip through your fingers. If you do, you'll regret it. Write us TODAY.

GLIDE "36-42" FEATURES

- Automatic Dynamo Lighting System
- Motor-Driven Tire Pump
- Unit Power Plant
- Long Stroke Motor with *Enclosed Valves*
- Center Control
- Left Side Drive
- Electric Side Lamps in Dash
- Electric Headlights and Tail Lamp
- An *Efficient* Self-Starter
- Floating Rear Axle with Pressed Steel Housing.
- 118-inch Wheel Base
- Demountable Rims (Baker bolted-on)
- Goodyear No-Rim-Cut Tires

Glide

THE BARTHOLOMEW CO., 220 Glide Street, Peoria, Illinois

CUTS USED IN THIS PUBLICATION ARE MADE *by the*

MOSS PHOTO ENGRAVING CO.

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295-309 LAFAYETTE ST. cor. HOUSTON
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TELEPHONE 81 SPRING
ESTABLISHED 1871

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The WOODSTOCK

"You can walk from there to anywhere"

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We now have 360 rooms with 265 baths.
Write us for descriptive folder with typical floor plan and rate card.
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Court room with bath, for one, per day.....$2.50
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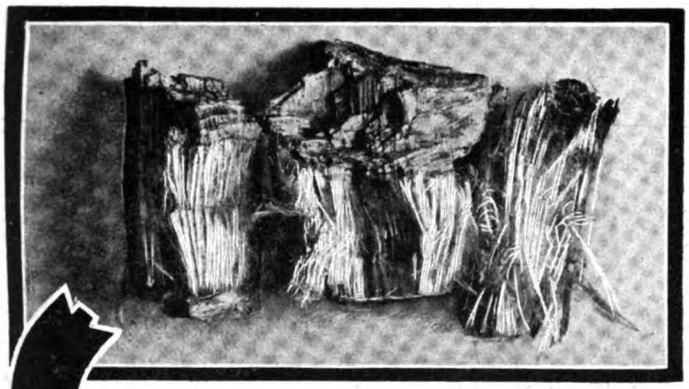


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Also
"THE BERWICK"
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TRADE MARK
Raybestos
REG. U.S. PAT. OFF.

The finest quality, long fibre asbestos goes into every inch of RAYBESTOS.

We know that the material used in the manufacture of this lining is distinctly better than is found in other linings.

Consider the high grade asbestos, the copper wire, the smooth, even weave, the careful sizing and special treatment and finishing.

No other lining on the market possesses the same high efficiency nor the same superior grade of raw material and care in manufacture.

Demand and Insist Upon Getting RAYBESTOS

Do not accept "cheap," loosely-woven linings. Your safety depends on efficient brake-action. RAYBESTOS makes every car a safe car and we stamp the name RAYBESTOS in every foot for your protection.

Ask Your Dealer for Raybestos

THE ROYAL EQUIPMENT COMPANY
436 Housatonic Ave. Bridgeport, Conn.

We also make Duplex and Raymond Brakes and Gyrex, the Mixer.

Mr. Automobilist:

Your tire maker is very anxious to impress upon you the importance of

Tires Inflated to the Right Pressure

He insists that this is tire economy and

Saves You Money

How do you know what pressure you have in your tires? A

SCHRADER
UNIVERSAL
Tire Pressure Gauge

(Trade Mark Registered in U. S. Patent Office)



(Patented March, 1898—Other Patents Pending)

will tell the exact pressure in your tires at any time, day or night, by simply holding this Gauge to your Valve for a second. Its recording sleeve remains in place, showing the exact pressure in the tire so that the Gauge can be taken anywhere and read, at night to the front of the car into the light of the lamps. After the pressure has been ascertained the Indicating Sleeve can be pushed back into the Gauge with your finger. No catches or snaps to operate or get out of order. This Gauge is 2½ inches long over all, short enough to apply easily to the smallest diameter of wheel and can easily be carried in the vest pocket or the change pocket of your trousers.

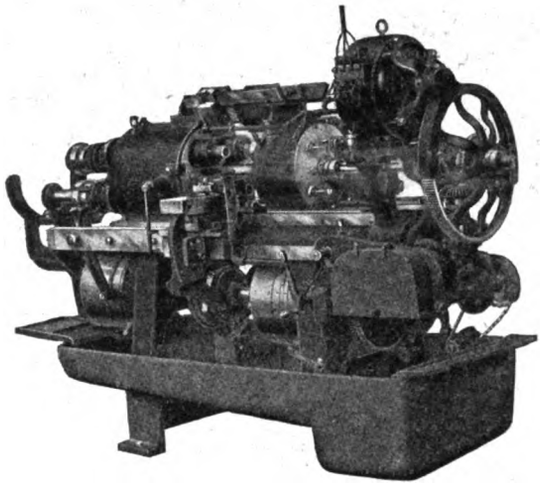
Price $1.00 Each
Ready for Delivery Now

Guaranteed Simple and Absolutely Accurate

Can be obtained from all tire manufacturers and the dealers, or

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Rapidity:—Obtained by working all the tools (as many as eight) at one time on four bars of stock—the time for the piece is one operation or less.

Accuracy:—Secured by the perfect alignment of the tools in relation to the spindles. And the complete rigidity of the whole machine.

Economy:—The machine requires very little extra time to set up. One man can operate four to six machines under belt or motor. And production is increased 50 to 200%.

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MANUFACTURERS know they are getting the results necessary to the automobile industry—accuracy and rapidity.

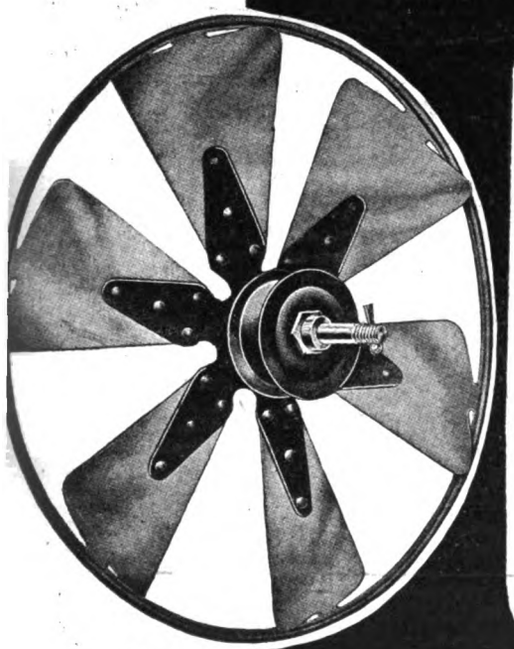
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Our Capacity 1,000 Fans Per Day

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Does Tire Expense Mean Anything to You?

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Every Ajax Tire is a dependable value—guaranteed for 5,000 MILES—a guarantee unequalled in the tire industry. It means 1500 MILES more service out of every tire.

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INTERLOCK INNER TIRES

Stop Tire Troubles

INVESTIGATE AND LEARN WHY SO MANY THOUSANDS OF MOTORISTS ARE DISCARDING INNER SHOES, RELINERS, FILLERS, AND OTHER MAKESHIFTS FOR INTERLOCK INNER TIRES—AND WHY INTERLOCKS ARE HANDLED AND RECOMMENDED BY THE BEST SUPPLY DEALERS AND TIRE HOUSES ALL OVER THE COUNTRY.

One weak point of the automobile to-day is that you can't depend on its tires. INTERLOCKS revolutionize this condition by making your tires so strong that blowouts become practically impossible. INTERLOCKS save half your tire expense—save repair bills—double your mileage—prevent punctures and completely free you from all fear of tire trouble.

What INTERLOCKS Are.—The INTERLOCK is a complete inner tire (not an inner shoe) which is placed between the outer casing and the inner tube to strengthen the outer casing and protect the tube. It is the only reinforcement which is locked by air pressure to the rim and which becomes an integral part of the tires, and, therefore, cannot heat or chafe. Even if the tire is broken the INTERLOCK will hold.

INTERLOCKS Insure Safety.—You know that the sudden blowing out of a tire may easily ditch any car when going at fair speed—the safety of INTERLOCKS should appeal to you.

Reduce Your Tire Expense.—You can have the tires on your new car equipped with INTERLOCKS if you specify them. INTERLOCKS are the only perfect tire reinforcement. They cost a little more but are cheapest in the long run.

For your present car—ask any dealer or supply house, or write to us for the name of your nearest supply source. INTERLOCKS will make any fairly sound tire more than carry you through the season. They are easily placed and are made in all sizes.

We Want Dealers Everywhere.—Write for Special 30 Day Offer, Booklets, Prices, Records of Road Tests and Testimonials of users.

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Have New Foot Control

This is the greatest single improvement in electric motor car construction that has been made during the past ten years.

A touch of the foot on the pedal shuts off the power and applies the brakes.

Our Catalog Explains this new system of foot control—also many other exclusive new Argo improvements. Write for it.

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DEPENDABILITY and Reliability are inseparable from Quality. In steering gears, Reliability is of vital importance. It is not a matter of money—it's a matter of safety.

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Besides, we give you prompt and dependable deliveries, service and satisfaction. Write.

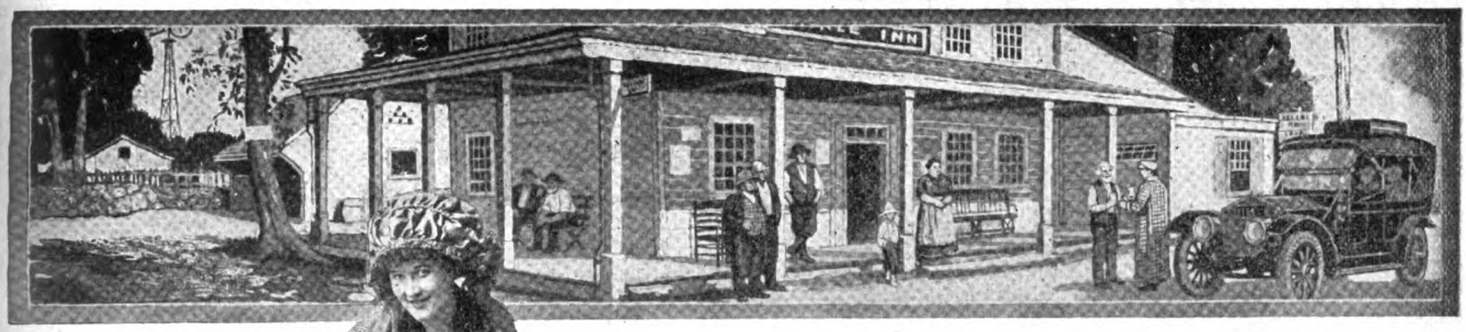
We modify our designs to meet your detail requirements, or build to approved designs on seasons quantity specifications.

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20 Vesey St., New York

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Kelly-Springfield Automobile Tires

As long as pneumatic tires are made of rubber their serviceability will be determined by the quality of that rubber.

The average mileage of Kelly-Springfield Automobile Tires stands a thousand or two above the average mileage of the average tire. It ought to—for since 1895, when we started out as the first manufacturers of rubber vehicle tires, our experience has enabled us to develop for Kelly-Springfield Tires a tough, long wearing composition of rubber that is pretty close to perfection.

Kelly-Springfield Tire Company, 20 Vesey Street, New York



All Tire Manufacturers will only guarantee their produce when filled with air at the recommended pressure.

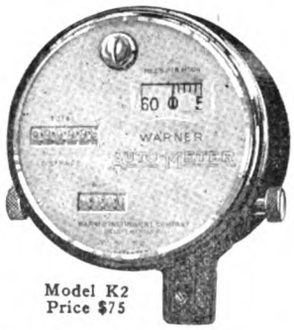
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Twitchell POSITIVE LOCK STOP Air Gauge

With it you can get more mileage out of the Tires, because you can always keep them at right pressure.

The Twitchell Gauge is Tire Insurance for a dollar—Order one from your dealer or from us direct.

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Model K2
Price $75

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THE decision of the prominent manufacturers to equip with the Warner Auto-Meter in 1913 constitutes OFFICIAL RECOGNITION by the automobile industry. High priced cars have long boasted Warners. More than 100,000 new cars will be Warner equipped this season.

Prices from $50 to $145. For sale by dealers all over the world and at our own branches. Handsome catalogue on request.

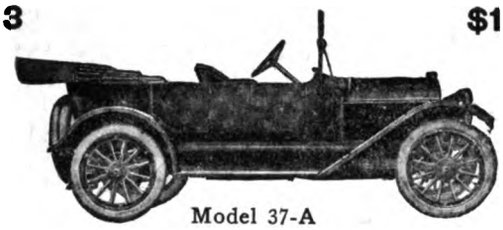
The Warner Instrument Company
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Marion

1913 **$1475**



Model 37-A
Completely Equipped

Disco Self-Starter.	Dynamo Lighting System.
Prest-O-Lite Tank.	80-Hour Storage Battery.
Warner Speedometer.	Q. D. Demountable Rims.
Concealed Tool Boxes.	Mohair Top, Boot, Curtains.
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Write for illustrated advance folder giving full details.

To automobile dealers we offer the fairest sales agreement ever written. Ask us about it.

THE MARION MOTOR CAR COMPANY
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Since the introduction of BENZ cars to the motoring public of America no car has attained such world-wide supremacy as to its construction, standing up quality, and material. The new type of 35 and 50 H. P. BENZ models are the last word in automobile construction.

The noticeable features of this type of BENZ cars include the offset crank shaft, smokeless oiler, and SILENT CHAINS instead of timing gears.

The BENZ Carrosseries are noted for their beautiful lines and thorough comfort.

To those desiring AGENCY of this car the Benz Company will offer special terms. We want RELIABLE, ENERGETIC agents to further our interests for both BENZ pleasure cars and BENZ-GAGGENAU trucks, which today stand recognized by those who know, as the leading 6-ton truck. Wire or write us, no matter where you are.

Our PRICES compete with LEADING AMERICAN makes.

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Direct Branch of Benz & Cie., Mannheim, Germany.

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THE UNIVERSAL CAR

"Naked truth" must compel the conviction that it is the height of extravagance to drive a heavy car at a cost of forty cents a mile—when a Ford will take you "yonder" and back as quickly and comfortably—and at less than one-tenth the cost.

75,000 Ford cars already sold this season—one-third of America's product. Four different bodies—all built on the one Ford chassis—five-passenger touring car—torpedo runabout—delivery car and town car. Get catalogue from Ford Motor Company, Detroit, Mich.

Remy Magneto

Exchange Your Old Magneto for a New Remy

IT will cost you practically no more than what you will be forced to pay out for constant repairs on your present ignition system. A new Remy will give your car new life. Here is our exchange proposition:

	List Price	Allowance	Net to You
2-Cylinder Remy Magneto with Coil, complete.....	$46 00	$ 9 20	$36 80
4-Cylinder Remy Magneto with Coil, complete.....	50 00	10 00	40 00
6-Cylinder Remy Magneto with Coil, complete.....	52 00	10 40	41 60

Allowance made for any make of Magneto.

Remy Electric Company
Anderson, Indiana

BRANCHES—New York, Boston, Detroit, Chicago, Kansas City, San Francisco, Indianapolis.

SERVICE STATIONS—Albuquerque, Augusta, Baltimore, Charlotte, Cincinnati, Cleveland, Denver, Dallas, El Paso, Houston, Jacksonville, Louisville, Memphis, Minneapolis, New Orleans, Nashville, Norfolk (Va.), Omaha, Los Angeles, Philadelphia, Pittsburgh, Portland (Me.), Portland (Ore.), Rochester, San Antonio, Seattle, Spokane, St. Louis, Syracuse, Utica, Washington (D. C.)

CANADA—Toronto, Winnipeg, Calgary, Hamilton, Vancouver, Montreal.

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Schafer Ball Bearings

The "Schafer" ball bearings are the standard of the world. They have been for years at the pinnacle of merit, and remain there because of exceptional workmanship, and the care taken in every step of the manufacture.

The ball bearings are made of especially analyzed, extraordinarily dense crucible cast steel, that combines uniform hardness with toughness from center to surface. All balls show a wonderfully great crushing strength and any ball showing the slightest defect is promptly rejected.

In specifying Schafer Ball Bearings, the manufacturer of the car is assuring the ultimate buyer of one point of quality that goes to make a good automobile still better.

Barthel, Daly & Miller
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BOSCH
Wins—Of Course
AT ELGIN

The Aurora Trophy Race

Mercer — Hughes — Bosch

The Elgin National Trophy Race

Mercedes — De Palma — Bosch

The Free-for-All

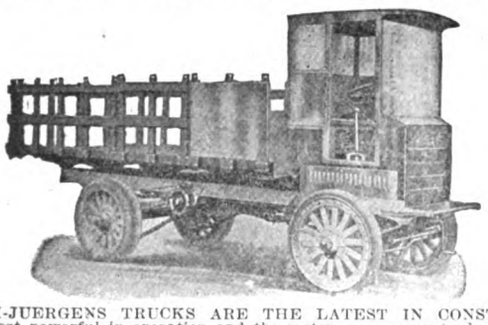
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ONE, TWO AND THREE TON CAPACITY



LAUTH-JUERGENS TRUCKS ARE THE LATEST IN CONSTRUCtion, most powerful in operation and the motors are guaranteed against defective workmanship and material for the life of the truck. They are positively the highest class trucks made. Two cylinder, one-ton, four cylinder, one, two and three-ton. Four speeds forward. Hess-Bright ball bearing transmission made in our own shops of the finest tool steel, three-piece disc clutch, covered by patents owned by us. Send for 1912 Catalog and specifications. Prompt delivery on all models. Large publicity campaign just begun. Our quality will do the rest.

Reliable Agents: Secure Your Territory for 1912 at Once.

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Great Northern Hotel
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Ideal Headquarters for Automobilists

Rates:
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$1.50 and $2.00
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Large, Comfortable Rooms
Grill Room Popular Prices
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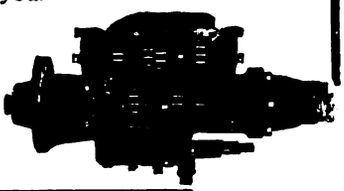
We make the best TRANSMISSIONS and at the least cost to the buyer.

We have the experience, equipment and determination.

The many who use them believe we do.

We believe we can convince you.

Will you let us try?



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Sales Office:
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Any Kind Every Kind Stock, or to Blue Print

Rims

Clincher Q. D. Demountable Channels

For Automobiles, Motor Trucks, Aeroplanes, Motorcycles, Bicycles.

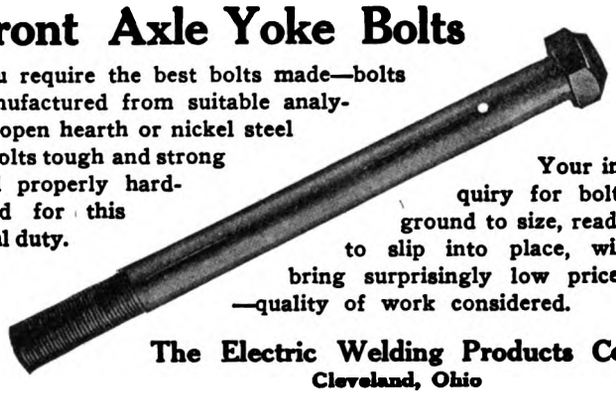
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Best on Earth — Kantsamore

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Automobile Wheels

For Pleasure Cars and Trucks

Repairing and truing old wheels a specialty. Experimental wheels quickly. We furnish and apply any style demountable or detachable rim or fix.

THE GRINNELL Gas Controller and Igniter

Price $30



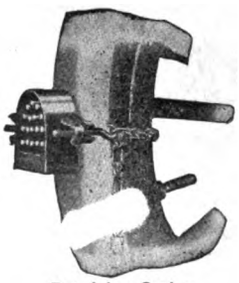
Lights, dims and extinguishes all gas lamps on the car through a simple turn of the hand. Coupled to valve-stem of acetylene tank. Direct control. Always within easy reach.

Convenient—Safe—Dependable

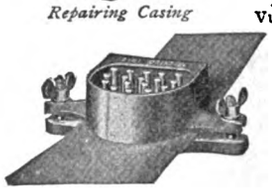
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Sole Licensed Manufacturers for the United States



Repairing Casing



TIRE CUTS ruin casings. They admit moisture to the carcass, cause the fabric to rot and weaken, grow larger—end in blowouts.

You can repair **CASINGS** and **INNER TUBES** anywhere in 15 minutes, better than a Repair Shop can do—and for *one cent.*

Universal Auto-Vulcanizer

Patented

A practical vulcanizing outfit complete with which to repair gum to make 40 patches. It weighs [illegible] can be carried in the tool box. **Simplest and most satisfactory device for eliminating tire troubles that has ever been devised.**

Absolutely automatic. Place the patch—attach the Vulcanizer—put in the gasoline light it. No further attention required. In 15 minutes the job is done.

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Price Complete, **$4.00** Ready for Instant Use

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should break their journey and avail themselves of the excellent facilities, afforded by the D. & C. Lake Lines, operating daily service between Detroit and Buffalo and Detroit and Cleveland.

Enjoy the delights of the cool breezes from Lake Erie and resume your journey in the morning after a refreshing night's rest. Special attention given by this Company to the handling of automobiles. Rates quoted on application (state wheel base); Tanks of Automobiles must be emptied of gasoline before being shipped; three gallons of gasoline supplied free on arrival at destination.

Roads in this section of the country are in first class condition; new road now under construction between Detroit and Toledo. Tourists speak highly of the route between Buffalo and New York.

On your trip this summer bear in mind "The Waterway is The Only Way."

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Standard Universal Rims



fit any style or make of tires. The side rings are reversible, they curve outward on one side to fit a straight side tire, inward on the other to accommodate a clincher. Two turns of a nut unlocks the rim for demounting, two more turns locks the rim in place. Write for catalog 607, which explains fully.



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The One Mechanical, Never Failing Warning Device

Costs Little to Buy—Costs Nothing to Operate

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$30.00 for a $105.00 6 cylinder
$20.00 for a $93.00 4 cylinder
$18.00 for a $65.00 2 cylinder
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Imported U. & H. High Tension Magnetos Less Than Import Cost.

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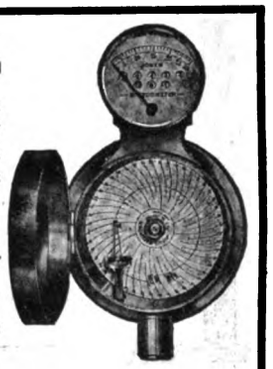
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IT TELLS ALL

When truck or car left garage, when it returned. How far it travelled, how fast. Number of stops, duration of each stop. Every movement of your vehicle is checked and shown on the



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400 MILES TO THE GALLON OF OIL

This is proof of the superiority of the Franklin re-circulating oiling system:—

And of the high efficiency of Franklin direct cooling.

It is double the average mileage per gallon of oil obtained by owners of water-cooled cars.

Franklin re-circulating oiling system delivers a steady stream of oil to each of the main motor bearings through separate leads. It is the only oiling system that feeds oil positively and directly to each of the main bearings.

The amount of oil pumped over the bearings is proportional to the needs of the motor. The faster the motor runs the more oil supplied. This means perfect lubrication under every condition of running.

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Unless your spark plugs resist soot and carbon, they are not up to the

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standard of efficiency.

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The NYBERG Line

MODEL FOUR-37

Two Passenger Roadster $1285
Five Passenger Touring Car $1295

MODEL FOUR-40

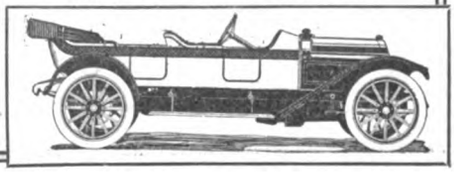
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Five Passenger Touring Car $1450
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"What car has sprang more quickly into prominence during the past two years than the Nyberg?"

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We Back Our Dealers to the Last Ditch

We know that the Niagara Self Starter will hold up and make friends for the men who sell it.

That's why we do not hestitate to guarantee every single starter without any qualification.

The Niagara Self Starter mixes the right proportion of gas and air in the cylinders of the engine.

That's why it always starts the engine—that's why it does not foul the engine.

The compressor in the Niagara Self Starter is made of seamless drawn steel tubing with a cast iron piston and two cast iron piston rings—the Niagara Self Starter will never wear out.

We still have some good open territory in which good money can be made.

If you are the right dealer, write us.

NIAGARA SALES COMPANY, Buffalo, N. Y.

Self Starter



Patent "Luxury" Folding Seats

Do you wish to make your car more comfortable by installing a pair of auxiliary seats? If so, have the best. Our seats are made in five styles. Send for catalogue.

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"Always There"

SPLITDORF ELECTRICAL CO.
98 Warren Street NEWARK, N. J.

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Do you buy a car for service—or for a season?

The answer is simple. You say "service," but do you always consider just what that means in a motor car

"Service" means a sturdy construction based on correct engineering ideas. The only way you can be sure of getting this is to buy a car that HAS BEEN PROVEN sturdy and mechanically perfect.

The "Sturdy Stutz" got its name as "the car that made good in a day," because the 500-mile International Sweepstakes at Indianapolis is certainly a thorough test of motor car efficiency, and the Sturdy Stutz stood the test and this passed with a record of A-1.

Merz, with his Stutz, who finished fourth in the last 500-mile Race at the Indianapolis Speedway Decoration Day, averaged over seventy-six miles an hour for the full distance.

Write for the story of "The Sturdy Stutz," and learn why it is the car to buy.

Some productive territory still open to dealers.

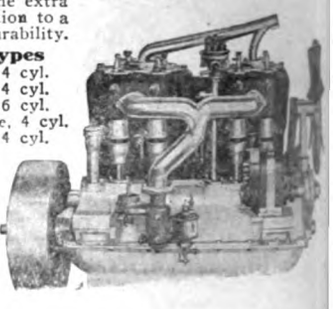
IDEAL MOTOR CAR COMPANY
Manufacturers of Stutz Cars
INDIANAPOLIS, IND.

Wisconsin The Consistent Motors

The crank shaft is of large diameter—a self-contained oiling system supplied by a gear pump through the hollow crank shaft provides perfect oiling. The extra large bearings reduce friction to a minimum and increase durability.

All 4 Cycle—in 5 Types

3¾ in. bore, 5 in. stroke, 4 cyl.
4¼ in. bore, 5 in. stroke, 4 cyl.
4¼ in. bore, 5 in. stroke, 6 cyl.
4¾ in. bore, 5½ in. stroke, 4 cyl.
5½ in. bore, 7 in. stroke, 4 cyl.



WISCONSIN
MOTOR MFG. CO.
Dept. 32
Milwaukee
Wis.

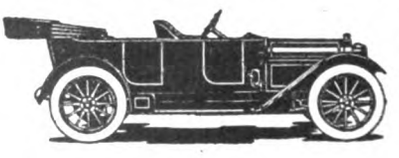
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Built to Last

We are now arranging agencies for 1913.

Write for full particulars

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St. Louis, U. S. A.

Mighty Michigan Forty



40-Horsepower Touring Car or Roadster, absolutely silent in operation. Cylinders 4¼ x 5¼-in.—116-in. wheelbase—34 x 4-in. tires—demountable rims—nickel mountings—massive, straight line body—big, roomy seats—proved self-starter—everything. Price $1500. Guaranteed for life by the Michigan Buggy Company. 40-horsepower Roadster on the same chassis. Two smaller models. Catalog on request. (82)

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GEARS

Bevel Differential
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$3,000,000 in plants affording the most superior facilities for fine work; also hardening and treating of the finished product. Most thorough inspection and testing system. Our own laboratory.

Brown-Lipe-Chapin Gear Company

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REPUBLIC

STAGGARD TREAD TIRES
and BLACK-LINE RED INNER TUBES

Motorists who use Republic Staggard Tread Tires will tell you that they—

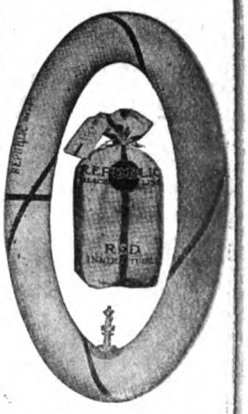
Prevent skidding, make quick starts and short stops easy.

Give double mileage because of the full-thickness tread under the studs.

Most Widely Imitated of All

We guarantee the Republic Black-Line Red Inner Tube to be as nearly perfect as a tube can be made—and is a fitting companion for the splendid Republic Staggard Tread.

The Best Tube Made



Republic Staggard Tread
Pat. Sept. 15-22, '08

The Republic Rubber Co.
Youngstown, Ohio



"Firestone"
Tires and Rims

are the least likely to require changing, and afford the best means of tire changing when required.



The Firestone Tire & Rubber Co., Akron, Ohio
and All Principal Cities

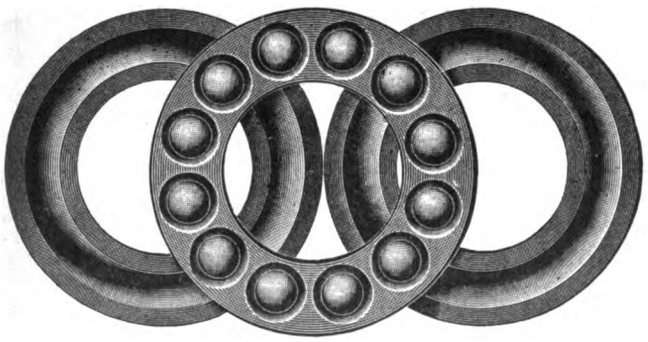
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We could build them cheaper
But We Won't.

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Folding Auxiliary Seats, Windshields, Bumpers, Wheel Pullers
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POSITIVELY SURE TO START
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are in 60% of the 1912 cars. Contracts for 1912 cover 80% of the entire output of American automobile manufacturers next year. Reason—New Departure Ball Bearings have "made good." Have you had our 1912 catalog?

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THE COLONIAL

Big, roomy, 5-passenger, open or enclosed car of distinctive design and luxurious appointments. Equipped with self-starting device. It's the car with a thousand little conveniences—

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DURABLE MEANS DEPENDABLE
DAYTON DELIVERY

DAYTON TRUCKS are made in 2, 3 and 5 ton models. They hold a world's record for durability, reliability and efficiency. Write for catalog.

DAYTON AUTO TRUCK CO. Dayton, Ohio

If You Need Motor Lamps

You Need This Catalog

We want you to write for the Solar Catalog before you decide on your motor lamps, for this is the most complete line of lamps on the market. Solar Lamps have been preferred by most motorists for the past fourteen years because of their brilliancy, their style, their strength and their several exclusive advantages—their special short focus lead glass lens mirror reflectors—the patented double ray light projection (in the Solarclipse), giving two distinct fields of light, for city and country use—the new black finish, the only such finish that's proof against heat and moisture—and other features that other lamps lack.

To fail to see Solars before you buy is to fail to include in your consideration the very finest lamps in existence. Solars are made for oil, electricity, gas and in combination, for pleasure cars, motor trucks, carriages, motor boats and airships. Write for catalog now—while you think of it. (136)

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SOLAR LAMPS

Drop Hammer Forgings

cost very little more than castings. They are vastly superior and less expensive in the end.

WE ARE SPECIALISTS

in producing

DROP HAMMER FORGINGS

from special analysis steel.

Send prints of parts you will need in

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HAYNES

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START YOUR CAR FROM THE SEAT
ALWAYS READY AND POSITIVE

The AMERICAN STARTER is the Only Starter on the market that measures the amount of gas injected into the cylinders. You cannot "dope" the engine with the AMERICAN STARTER.

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SOLD EVERYWHERE

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Long-Stroke "32"
Touring Car
$900 F. O. B. Detroit

Motor 3¼ x 5½ inches; four cylinders; Bosch magneto; three speed sliding gears; tires 32 x 3½ inches; 106 inch wheelbase. Equipment includes windshield, gas headlights, generator, oil lamps, tools and tire repair kit.

Roadster body on same chassis and with same equipment, $900 F. O. B. Detroit.

20 H. P. Models

Runabout—$750
F. O. B. Detroit. Same power plant as World-Touring Car. Wheelbase, 86 inches. Equipment of top, windshield, gas lamps and generator, oil lamps, horn and tools.

Roadster—$850
F. O. B. Detroit. Same chassis and power plant as World-Touring Car. Wheelbase, 110 inches. Same equipment as Runabout, also highly finished steel box on rear deck for tools and accessories.

Coupe—$1100
F. O. B. Detroit. Same power plant as World-Touring Car. Wheelbase, 86 inches. Electric headlights, electric and oil side and tail lamps, folding dash seat for third person. Rear tires, 31 x 3½ inches. With 110 inch wheelbase, $1150.

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Hook up with COLE

COLE

Series Eight comes in Three Chassis:

Cole Sixty six cylinder Touring Car, five passenger convertible to seven passenger, 132-inch wheel base, Delco electric lighting, starting and ignition. $2485

Cole Fifty four cylinder Touring Car, five passenger convertible to seven, 122-inch wheel base, Delco system. $1985

Cole Forty four cylinder Touring Car, five passenger, 116-inch wheel base, Delco system. $1685

WRITE TODAY for Cole Blue Book and dealer's proposition.

COLE MOTOR CAR CO., Indianapolis, Ind.

Hook up with COLE

A prudent buyer in selecting an automobile of permanent utility seeks the security of an established guarantee.

4 and 6 Cylinder Motors
2, 4, 5 and 7 Passenger Cars

KLINE CAR

4 Speeds Forward
Self-Starting
Detachable Rims

One Quality in All Models

4-30	$1700 $1750	4-40	$2200 $2250	6-50	$2800 $2850	6-60	$3300 $3300

Agents wanted in open territory. Write today.

KLINE MOTOR CAR CORPORATION, York, Pa.
Factories: York, Pa., Richmond, Va.



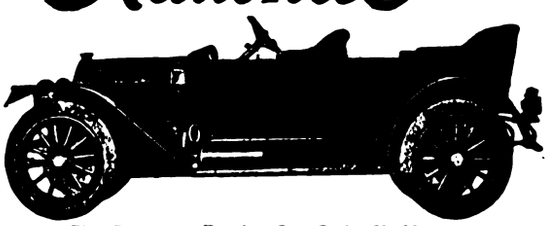


Climbs a 50% grade—Friction Transmission—any number of speeds. Five models—write.

CARTERCAR COMPANY, Pontiac, Michigan

Stock Champion — International Champion

National 40



Five Passenger Touring Car, Series V, $2,900

NATIONAL MOTOR VEHICLE COMPANY
1007 E. 22nd Street — Indianapolis, Ind.

The *Pioneer* Moderate Priced Six-Cylinder Car

HAVERS - SIX - HAVERS MOTOR CAR CO.

Havers Self-Starting "Six-44"

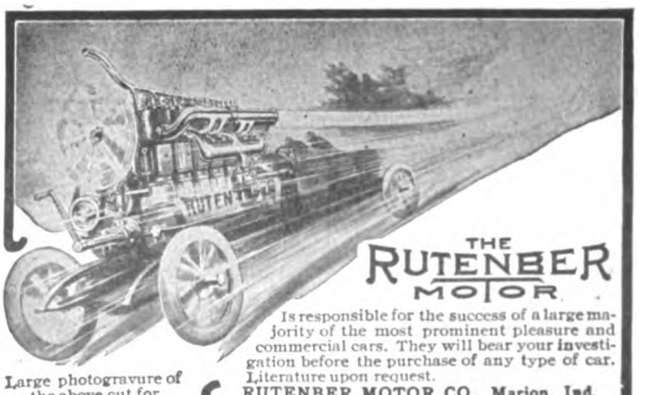


Price $1850

SPECIFICATIONS TALK—Six-cylinder Motor, 4-cycle long-stroke type; 44 H. P.; Bosch Magneto; dual system; Model "C" Stromberg Carburetor. 122-inch wheel-base; 36x4-inch wheels; self starter. Springs, semi-elliptic front, platform suspension, rear; rear axle, full floating type.

Full specifications sent on request.

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RUTENBER MOTOR CO., Marion, Ind.

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Complete line of commercial vehicles—all type bodies—special bodies designed. KisselKar Trucks have excess capacity, reserve power. Low fuel cost—sizes to give economical service under any conditions.

1500 Lbs., 1, 2, 3, 4, 5 Ton Trucks

KisselKar Service keeps down operating costs. Write for special truck catalog.

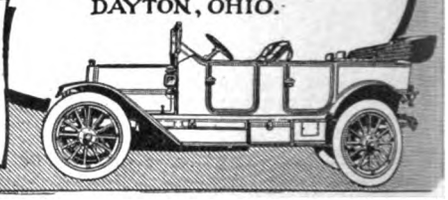
Kissel Motor Car Co., 159 Kissel Ave., Hartford, Wis.

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A Car with those Qualities that really count

THE SPEEDWELL MOTOR CAR CO.
DAYTON, OHIO.

Touring Car
7-Passenger
$2,900
Fully Equipped including Self-Starter

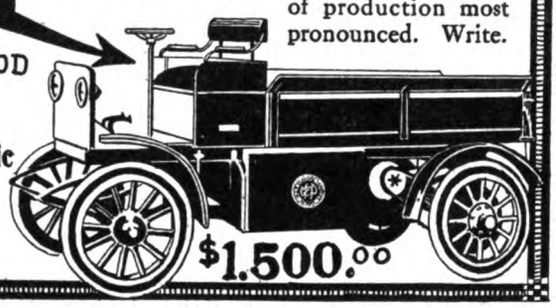


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DEALERS—Here is the first electric truck that sells for about $700 less than any other. Capacity 1000 pounds—Service 100 per cent. more than gasoline truck—Economy of production most pronounced. Write.

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The Motor With the Sliding Crescent Valve

KNIGHT-DAVIDSON
1896 — 1912

The CRESCENT valve of the K-D Motor, fitting around the stationary piston wall affords a larger port area than any other poppet or slide valve on the market. It is simpler and, consequently, better than any other valve construction known and is here offered to discriminating manufacturers, not as an experiment, but as a tried, tested and proved mechanical advance. The K-D motor is simple, silent, cools rapidly, has the simplest oiling system known, will not carbonize. Last and most important, will give on a given quantity of fuel more power, speed and endurance, unit for unit, than any other engine on any type of an automobile. We want to present some facts to interested manufacturers.

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The Easiest Riding Car in the World

MARMON

Thoroughly expressive of the highest development of automobile design, materials and construction.

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THE NEW SERIES
Marmon "32"
$2850 to $4100
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Sixty Years of Successful Manufacturing

"Distinctly Complete"

Electrically Self-Started and Lighted

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Six Models 40 and 50 H. P. Fully Equipped

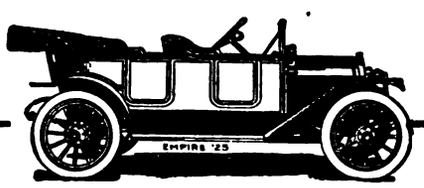
Model 40—5 Passenger, Fore Door Touring Car.
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Fully equipped with top, windshield, speedometer, gasoline gauge, 36" wheels, demountable rims, and automatic tire pump.

All fully described in our Art Catalog. Send for one today.

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Boston Branch: 153 Massachusetts Ave. Omaha Branch: 310 S. 18th St.



Empire Twenty-Five

"The Little Aristocrat"

This is the Big Brother of the Famous Empire Roadster and is a small edition of $5,000 cars.

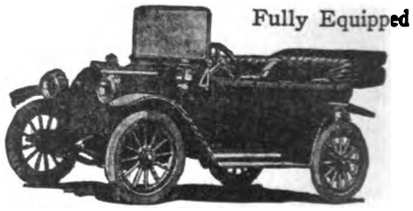
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The Detroiter—$850

Fully Equipped

Five Passenger Touring Car



25 H.P. Long Stroke Motor

Enclosed Valves, Three Point Suspension, Unit Power Plant, Platform Rear Springs, Full Floating Axle, Left Hand Drive, Center Control, Drop Frame, Large Tires, Complete Ball Bearing Car. Write for specifications.

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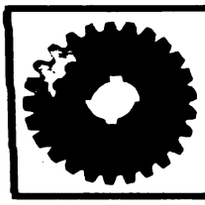


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Mosler **Spit Fire** Plugs
ARE THE BEST
A. R. MOSLER & CO.
P. O. BOX "M"
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GRANT - LEES GEARS

The Grant-Lees Machine Co.
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"The Speedometer of Quality"

Special features that eliminate speedometer troubles. Send for the booklet.

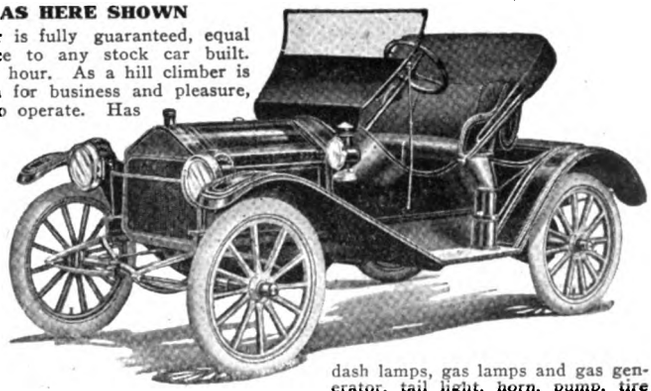
Reliance Speedometer Co.
134 Eliot St. Boston, Mass.

ARE YOU in need of any additional help in any department of your business? Are you out of employment or looking for a better connection? Have you second-hand apparatus of any kind or do you want to buy second-hand material? Have you a factory site for sale or do you want to buy one? If so, use the Want and For Sale column of the Motor World. Seven words to the line, fifteen cents a line. Advertisements can be inserted over a number when it is desired and identity of the advertiser will be kept confidential.

METZ "22" The Maximum Car At the Minimum Cost **$495.00**

FULLY EQUIPPED, AS HERE SHOWN

THE METZ "22" Roadster is fully guaranteed, equal in speed and endurance to any stock car built. Makes from 5 to 50 miles per hour. As a hill climber is unsurpassed. It is ideal both for business and pleasure, and is the most economical to operate. Has graceful lines, handsomely finished, the body being dark blue, with cream wheels. It is the car the American public has been waiting for, and is



A Big Money-Making Proposition for

DEALERS

The METZ "22" is operated by center control, thus leaving BOTH sides of the car unobstructed for convenient entrance and exit. Has specially designed wind shield.

Other features include: Four-cylinder, water cooled motor; Bosch magneto; full elliptic springs all around; best quality clincher tires; torpedo semi-enclosed body; extension top, with curtains entirely enclosing car when desired; dash lamps, gas lamps and gas generator, tail light, horn, pump, tire and tool outfit—a strictly high class Roadster, completely equipped for $495.00.

WRITE FOR ILLUSTRATED CATALOG and learn about all the remarkable features of the METZ "22." It travels from 28 to 32 miles on 1 gallon of gasoline, 100 miles on a pint of lubricating oil, and from 10,000 to 12,000 miles on a single set of tires. It is the MAXIMUM car at the MINIMUM cost. Investigate the METZ "22." We want dealers in unoccupied territory.

METZ COMPANY, WALTHAM, MASS.

Cutting

1913 IMPORTANT FEATURES

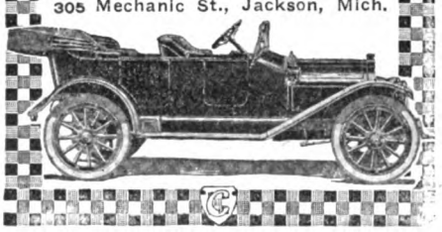
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Turkish Cushions — 36-in. x 4-in. Tires
12-in. Upholstering — Increased Wheel Base
Great Ease of Riding Carburetor Dash Adjustment
Demountable Rims — Nickel Trimmings
Unit Power Plant—three point suspension.

Cutting B-40. 120 in. Wheelbase, 40 h. p. 5-passenger touring car, fully equipped, **$1475**

Cutting A-40. 120-in wheelbase. 40 h. p. 2 passenger roadster, fully equipped, **$1475**

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CLARKE-CARTER AUTOMOBILE CO.
305 Mechanic St., Jackson, Mich.





Abbott-Detroit

"The demand of the day is that an organization shall be judged by its product and not by what it claims for itself" Keep this in mind when you examine these 1913 models

MODELS AND PRICES

30-40	Fore-door Roadster, 116-inch wheel base	$1700
34-40	5-passenger, Fore-Door Touring Car 116-inch wheel base	$1700
44-50	5-passenger, Fore-Door Demi-Tonneau 121-inch wheel base	$1975
44-50	7-passenger, Fore-Door Touring Car 121-inch wheel base	$2000
44-50	Battleship Roadster, 121-inch wheel base	$2150
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607 WATERLOO STREET DETROIT, MICH.
"Built for Permanence" "Guaranteed for Life"

Perfection Spring Company
SPECIALISTS IN
Spring Suspension
High Grade Only
Cleveland, Ohio

Send Us Your Inquiries When in the Market for

Sheet Metal Stampings

Estimates Cheerfully Furnished

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For Quickly Repairing the Inner Tube

The Portable **Ever-Ready**

Imperial Vulcanizer Repair Kit



Nickel Plated Weighs 3 Lbs. Patent Pending

Price $3.50

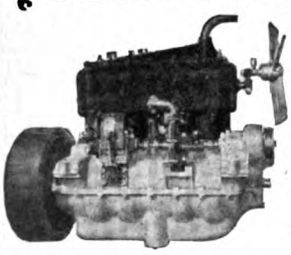
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Best known motor in America. Look for the name "Continental" on the crank case. We have looked after the quality behind it. 4 and 6 Cylinders 20 to 60 H. P.

Continental Model "C" *Write for Booklets*

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FACTORY REPRESENTATIVES;
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L. D. Bolton, ... 1810 Ford Bldg., Detroit

STOP PAYING GARAGE RENT
Why Not Own Your Own Garage?

We are Manufacturers and Builders of Fireproof Steel Garages of all sizes. Write for Catalogue and prices.

THE FIREPROOF GARAGE COMPANY
1226 Ridge Avenue Philadelphia, Pa.



Tones down headlights for city driving and foggy nights - an auto necessity. Price 75c. per pair. Sell like hot cakes. Dealers, secure the agency quick.

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1931 Broadway, New York

Aluminum Bodies
THE SPRINGFIELD TOP
(Pat. 1895)
SPRINGFIELD METAL BODY CO.
366 Birnie Avenue, Springfield, Mass.

Weed Chains

The Great Anti-Skid DEVICE

Nine-tenths of all accidents to automobiles are caused by skidding or slipping.

Either you skid into the "other fellow" or the "other fellow" skids into you.

No matter how careful a driver you may be, you cannot prevent skidding or slipping on wet, muddy snow-covered roads or on icy, slippery greasy pavements unless you equip your car with Weed Chains.

Cannot Injure Tires
Because They Creep

An absolute necessity on both rear wheels and if you want to know what real steering steadiness means put them on the front wheels too.

For your own safety—for the safety of the public, fully equip your car with Weed Chains. Make it your business to get a set today.

The Name "Weed" on Every Hook

Recommended and sold by all reputable dealers

Weed Chain Tire Grip Co.
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Standard Bearings
are
Enemies of Friction.
Why Don't You "Standardize"?
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75% Increase in Tire Efficiency

That's what the INNERSHU accomplishes. It's a tough, durable, rubberized fabric formed permanently to tire shape. Ask for circular.

INNER SHOE TIRE COMPANY
Front Street Grand Rapids, Mich.

We Specialize on
Finishing Crank Shafts
Only.
MICHIGAN CRANK SHAFT CO.
Lansing

Locomobile Cars for 1912

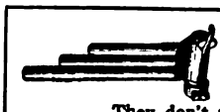
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INVADER OIL
"The Best the World Affords"
CHAS. F. KELLOM & CO.
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Auto-Top Fabrics
OF EVERY DESCRIPTION
SAMPLES AND PRICES ON REQUEST
L. J. MUTTY CO., Boston

We have something brand new to offer in
COTTON WASTE at a saving of $40.00 per ton. **DIXIE BRAND**
Write for samples and particulars.
FOWLER WASTE MANUFACTURING COMPANY
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MINERVA AUTO HORN
Powerful—Musical
They don't sell on sight, but
They do sell on sound.
Write for prices and circular.
THE MINERVA HARDWARE MFG. CO.
Minerva, Ohio

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These Tires for You

Four corps of experts working in four of the best equipped tire plants in the world are operating as a unit to produce.

UNITED STATES TIRES

Nothing of the kind has ever before been attempted in automobile tire manufacturing.

United States Tire Company
New York

To Smooth Rough Roads

THE LITTLE STEERSMAN



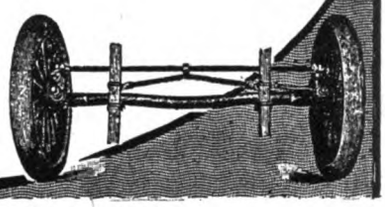
The one device most needed by the man who wants to make steering a pleasure instead of a labor.

Removes all nervous strain—takes physical strain from steering operation—holds machine steady—prevents accidents in case steering gear breaks or tire bursts.

DEALERS, JOBBERS, MANUFACTURERS, this is an article which merits your instant investigation—one which will appeal to every car owner. It ought to be, and soon will be a part of the equipment of every car.

Let us tell you more about it. The story is worth knowing.

The Modern Auto Appliance Co.
15 Kinderhook Street
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Why We Blow Our New Electric Continental Horn

Complete information furnished dealers on request.

THE MOTOR CAR EQUIPMENT CO.
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The ONLY gas tank that when empty, can be immedi.tely exchanged for a full one, ANYWHERE and ALWAYS.



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For Pleasure Cars and Light Delivery Cars
Send for Booklet 58

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THE BUSH MANUFACTURING CO.
HARTFORD, CONN.

The Otho System

for Self Starting Lighting Ignition Signalling

"Is right Inside the Flywheel"

Otho Motor Co., 60 State St. Boston, Mass.

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will help you to increase your business while benefiting your customers. We will send any responsible dealer a pair on 30 days' trial Write now. Good Agents wanted for unoccupied territory.
LEATHER TIRE GOODS CO., Niagara Falls, N. Y.

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Final and crowning achievement of R. E. Olds, pioneer designer of autos. A standard size 30 to 38 horsepower four cylinder car of modern refinements priced for the present at only $1,055.

(38) R. M. OWEN & CO., General Sales Agents
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GOODYEAR

AKRON, OHIO.

This name on Automobile Tires and Rubber Accessories signifies inherent qualities of material and workmanship that insure the maximum of service at the minimum of expense. (673)
The Goodyear Tire & Rubber Co., Akron, Ohio



Magneto Plugs coax maximum power out of engine.
EMIL GROSSMAN COMPANY, Mfr., New York and Detroit



The Ford Water Circulator

forces the water from radiator through cylinder water jacket, maintaining rapid circulation when car is in motion. Write for descriptive matter if you handle Ford cars.

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LBA STORAGE BATTERIES

Class A for Electric Lighting
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Manufactured by
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"THE MASTER CAR" FIFTEENTH YEAR

4 Cylinder 35 H. P. $4500; 6 Cylinder 50 H. P. $5500
(Completely Equipped)

The Fiat Agency Policy Is One of Permanency

POUGHKEEPSIE **F.I.A.T.** NEW YORK

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15 cents per line of six words, cash with order:
— In capitals, 25 cents per line —

A market place where Dealers, Jobbers and Manufacturers may buy, sell or trade used cars, parts and appliances and where help or situations may be secured at a nominal cost.

THE STEVENS-DURYEA COMPANY HAS ERECTED AND EQUIPPED A MODERN AND UP-TO-DATE FACTORY FOR MANUFACTURING THEIR OWN BODIES AND IS NOW READY TO RECEIVE APPLICATIONS FROM FIRST-CLASS WORKMEN IN THE SEVERAL BRANCHES OF BODY BUILDING: BODY MAKERS, SHEET METAL WORKERS, PAINTERS, UPHOLSTERERS, ASSEMBLERS, ETC. ADDRESS: SUPERINTENDENT, STEVENS-DURYEA COMPANY, EAST SPRINGFIELD WORKS, SPRINGFIELD, MASS.

AGENTS WANTED—To handle the $1000 G. J. G. "Junior," racy, classy and specially designed chaseabout with 104-inch wheelbase, with a real 26 H.P. motor, Bosch magneto, Dorian remountable rims with 32 x 3½ tires, at a price of $1000, which is a money maker for the sales agent. Write for literature and discounts to G. J. G. MOTOR CAR COMPANY, White Plains, N. Y.

MOHAIR—DUCK—CANVAS—TOPS
PEERLESS AUTO TOP DRESSING
restores the faded top to its original color. A leaking top is waterproofed with one coat. It does not stiffen or harden to break when the top is folded. Anyone can apply it. Sold all over the country by Garages and Supply Dealers. Price: 1 gallon can, $3.75; ½ gallon can, $1.90; ¼ gallon can, $1.00.
THE COLUMBUS VARNISH CO.,
Columbus, Ohio.

MARQUETTE BUICK, 100 H.P., first American car to finish in Grand Prize; perfect condition; new tires; $1,000 worth of extra parts; run 1,800 miles. Pope Hummer, 60 H. P. R. L. HOWARD, 81 Manhattan Ave., New York City.

ONE HUNDRED AND TWENTY-FIVE DOLLARS takes 2-cyl. Rambler 5-pass. touring car; will demonstrate. FISKE, 119 Smith St., New Bedford, Mass.

WANTED—High powered automobile motor. Box 216, care Motor World.

FOR SALE—Dealer in new and second-hand automobiles; Ford runabout, 4 cyl., 26 H.P., top, windshield, rumble seat. Maxwell runabout. Oldsmobile, 4 cyl., top, 5-passenger, and windshield. Rambler, 2 cyl., top, 5-passenger, and delivery body, all in good condition. F. B. ARDRIE, 21 Carnes St., W. Lynn, Mass. P. S.—Wanted—to buy 50 automobiles.

PEERLESS LEATHER TOP DRESSING
Makes leather, rubber and pantasote tops and curtains look like new. A safe, durable renovator that leaves the cloth soft and pliable.
The Columbus Varnish Co., Columbus, O.

WANTED—First class electric automobile machinist and repairmen in Denver, Colo. P. O. BOX 1023.

SEVENTY $2,000 cars handled the past season, but we need more capital. We have the best selling proposition in a western city of 10,000, with territory comprising seventeen counties. Throughout the country agencies for this car are acknowledged more desirable than any other in its class. Address Box 215, care The Motor World.

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Waterproofs mohair and duck automobile tops and curtains. Makes faded and stained tops look like new. Leaves the cloth soft and pliable. Dries over night.
The Columbus Varnish Co., Columbus, O.

AUTOMOBILE Cylinders reground, new pistons and rings fitted. Garage air compressors. CAST IRON BRAZING CO., Manchester, N. H.

WILL GIVE MY PERSONAL MORTGAGE on improved real estate for a 1911 or 1912 Auto in good shape and worth prices asked; must be a reliable make. C. A. SACKETT, 21 Broad St., Milford, Conn.

WANTED—Town car or touring car body for model T Ford, fore door preferred, but any model considered, state price. A. J. SMITH, Plymouth, Mass.

PEERLESS BACK AND CUSHION DRESSING.
A renovator for leather seats and cushions. Brightens the finish, softens the leather and does not crack or peel. Dries in 20 minutes.
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STEAM Vlucanizing Plant—Complete, worth $200; only $25. 3528 N. 27th St., Omaha, Neb.

PEERLESS EXTRA FINE BLACK BAKING JAPAN.
Bakes to either a high gloss finish, egg-shell gloss or dull finish, on lamps, radiators and fenders. Will not crack, chip or peel.
The Columbus Varnish Co., Columbus, O.

An ad. like this will cost you $1.35 for each insertion.

Mr. Dealer:

You will surely find some where among these announcements a buying opportunity—

A straight line to something you want now—

Look them over and see—

* The circulation of The Motor World is a guaranteed one, sworn to by an affidavit, which will be sent in detail to any one upon request.

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15 cents per line of six words, cash with order. — In capitals, 25 cents per line —

A market place where Dealers, Jobbers and Manufacturers may buy, sell or trade used cars, parts and appliances and where help or situations may be secured at a nominal cost.

E 5 passenger Auto body, with top, $35.00. Rear axle, $20.00. H. KAS- Spencerville, O.

W PROPOSITION; $10 to $15 daily; made easy; men, women, everybody g; capital, experience unnecessary. g plan, particulars free. J. C. JACK- 4759 Evanston Ave., Chicago.

PEERLESS LINING DYE.
s a new lining out of a dirty, faded stained inside. Will not fade or wash Leaves the cloth soft and pliable. Columbus Varnish Co., Columbus, O.

ENNEY NUT LOCK. Won't jar off. Holds tight wherever vibration ex- Patent and all rights for sale. Dr. F. KENNEY, 122 Hope St., Provi- e, R. I.

LESMEN, one who is now visiting automobile trade or owners. Good ey made on a very attractive proposi- STURDY MFG. CO., 2637 Michigan , Chicago, Ill.

BROKEN CRANKSHAFTS, cylinders, crankcases, flywheels, gear teeth, pistons, perfectly welded and machined ready to replace. Guaranteed and references. Machinery up to 5 tons welded. ATLAS WELDING WORKS, 74-76-78 Irving St., Rahway, N. J.

AUTOMOBILES—A. C. C. A. Prices Talk! Every make. Every model. Hundreds runabouts, racy roadsters, five-seven passenger touring cars. $50 up. Guaranteed five years. Shipped Freight Prepaid! Write today for the largest Illustrated Catalog published! THE AUTOMOBILE AND CYCLE COMPANY OF AMERICA, Dept. I-N, 1769-1787 Broadway, New York City.

FORD OWNERS—GET OUR CATALOG. AUTO PARTS CO., PROVIDENCE, R. I.

VALUABLE INTEREST in several inventions for sale, some fully developed ready for marketing and others nearing completion. Our work is all along practical lines and we now have several successful inventions placed with reliable manufacturers. One of our inventions has reached a sale of over a million dollars and we have some others even better in preparation. It is desirable that some of these be brought out promptly, therefore for a moderate investment we offer a first-class opportunity to the right party. Someone connected with the automobile industry in a business way preferred. Party investing may have control in a business way, as we prefer to be interested in the royalty end only. We mention an all steel safety wheel using standard tires, which is stronger, lighter and cheaper than present forms, quick detachable, demountable, automatic, etc. An electric starting and lighting outfit with a tire pump, easily attached to present cars. A carburettor incorporating a new and original system of control and universally attachable. A speedometer of extreme simplicity operating on a new principle which readily adapts itself as a unit with a clock mechanism. Any or all of these are capable of development into a large business, and we have several others equally as good. Full particulars given to anyone willing to show financial ability to properly handle . Address ENGINEERS, care of Motor World.

AUTOMOBILISTS — Buy guaranteed tools and inner tube puncture-repairing material. Do your own repairing easily and quickly. Agent's price, $5.00; ours, $3.50, cash with order. Bank references. W. H. MIZELLE, Robersonville, N. C.

SCORED CYLINDERS repaired, $12. No enlargement of bore—no need for new pistons and rings. Send piston with cylinder. Absolutely reliable method. References, testimonials, and full details on request. WATERBURY WELDING CO., Waterbury, Conn.

PEERLESS EXTRA FINE BLACK JAPAN.
Enamels lamps, radiators and fenders to a fine gloss finish. Will not crack, chip or peel. Not affected by heat, retains its lustre.
The Columbus Varnish Co., Columbus, O.

FOR RENT—Factory Building, Syracuse, N. Y.; 18,000 square feet floor space, on best street in the city; engine, boiler and shafting complete. Two elevators, city water, gas and electric service, and equipped with sprinklers. Use of railroad siding. Electric cars pass office door. apply GEORGE N. COMLY, 1816 West Genesee St., Syracuse, N. Y.

TO RESPONSIBLE parties only — Packard 18 touring car or limousine, will rent monthly or winter season with driver; reasonable. For full particulars write only to S. S. ZULA, 322 Columbus Ave., New York.

Then remember that *8,000 her readers are doing the me thing—

5,000 of them dealers—

All of them intensely interested in the automobile industry. This means a live selling opportunity that costs mighty ttle.

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THE SHELDON LINE



The SHELDON line of axles, jack shafts, and brake equipment is the most comprehensive ever turned out by the manufacturer of any particular automobile part.

Our experience, which dates back thrity years, our equipment which is the largest and most up-to-date in the world, our material which is the best that money can buy—these factors are sufficient to justify our claims to superiority. Everything in the line of automobile axles and everything of the best is the SHELDON slogan.

No contract, however large or diverse, is too big or too complicated to be properly handled by the SHELDON facilities. Every ounce of material used in SHELDON construction undergoes the most rigid examination in our chemical and physical laboratories, and every axle bears the stamp of SHELDON quality and SHELDON uniformity.

Manufacturers who equip their cars with SHELDON AXLES can rely on a reputation which for responsibility and thoroughness of production is unsurpassed. Remember that large scale production inevitably means economy of manufacture, and this economy creates a surplus which goes back into SHELDON quality.

SHELDON AXLE COMPANY
WILKES-BARRE, PA.
DETROIT BRANCH: 1215 WOODWARD AVE.

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80 PER CENT

of all automobile damage through accident is greater than the cost of the Conover Safe-Guard that would prevent it!

A SMASHED radiator; a broken lamp; a twisted spring; a battered mud-guard. These mean money.

The driver is not necessarily to blame. A frightened horse in a crowded street may back up, —or another car; the brakes may be applied a moment too late to prevent collision with a telephone post, a porte-cochere, another vehicle. This danger is constant.

The *sure* means of preventing it is the Conover Safe-Guard.

The Conover Safe-Guard is a vast improvement over any other guard-rail on the market.

Its surface is ***flat***—not round —and it is 2 in. or more in width.

IT is supported at four points —rather than two—by heavy semi-elliptic springs of the same quality of tempered steel as the chassis springs in the most expensive car. These springs will stand many times as severe a shock as will the small spiral springs of the ordinary bumper; —especially since the breadth of Conover contact surface distributes the force of the shock over a comparatively wide area, and thus materially reduces it.

The Conover is sold under an unprecedented guarantee against damages from any cause, covering a period of ***two years.***

It is a handsome addition to the equipment of any car—as distinctive as it is substantial.

Best quality of steel heavily enameled in black, royal blue, French gray or maroon; bar 2 in. wide - - - - *(Any other color of enamel $5.00 extra)*	**$15.00**
Best quality of steel, brass or nickel plated; bar 2 in. wide	**17.50**
Solid bronze, finished in either brass or nickel; bar 2 in. or 2⅝ in. wide - - - - - - - -	**25.00**

Shipped, express paid, anywhere in the United States, on thirty days' trial, upon receipt of the regular price. When ordering give name and model of car. Specify size and finish desired.

An attractive booklet will be sent free upon request.



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Sellers Newark, N. J.

NEW JERSEY TUBE CO.
Makers Newark, N. J.

CONOVER

"The Dependable Safe-Guard"



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Studebaker

That Important Question—"Who Is Behind the Car"

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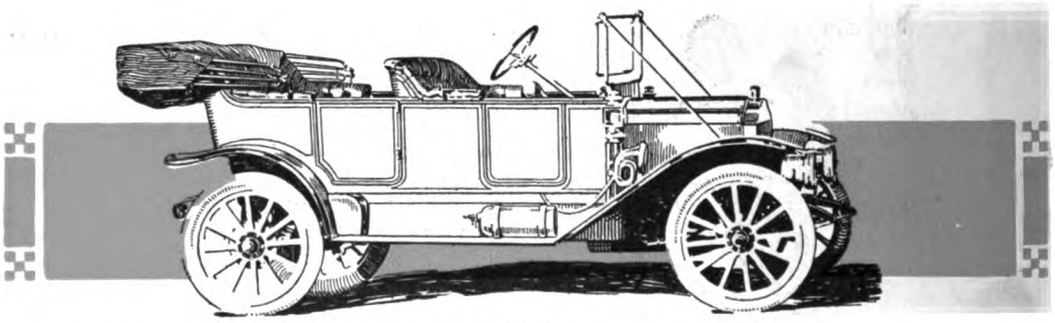
The supremacy of The Studebaker Corporation is a guarantee that looks beyond the time of sale. It looks to a future of the organization and to your future because it looks to the future of the car.

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To help you in maintaining that satisfaction we have established a national Studebaker Service, which now has 36 factory branches, so that Studebaker parts—and all of these are made by us—may be quickly accessible to owners everywhere.

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The $800 Studebaker (Flanders) "20"

Equipped with Top, Windshield, Prest-O-lite Tank and Speedometer, $885 f.o.b. Detroit

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(Nickel or Brass Trimmed)

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Touring Car	$800	Touring Car	$1100
Roadster	750	Detachable Demi-Tonneau	1100
Utility Car	800	Roadster	1100
Delivery Car	800		

See our dealer. You can get prompt delivery. Our Art Catalog A-9 is yours for the asking.

The Studebaker Corporation Detroit, Michigan

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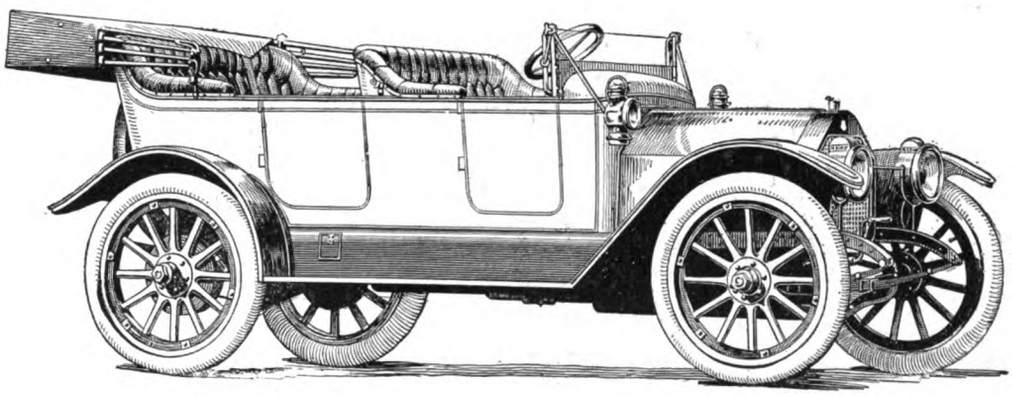
THE MOTOR WORLD

A Trade Paper Giving the World's Motor News

Vol. XXXII
No. 13

New York, September 19, 1912

Ten cents a copy
Two dollars a year



1913's Remarkable Car Value—the Big, Handsome Maxwell "40"

Fully Equipped, $1675

We have built a finer Maxwell than ever before. It embodies the very latest refinements; is large and powerful; and retains all the thoroughly proved Maxwell mechanical features. The detailed value crowded into this new model, summed up, make it easily the leader among all cars under $2500.

NOTABLE FEATURES

Left hand drive	Demountable rims	Turkish cushions	High grade lamp equipment
Center control	French design body	Two front doors	Electric lights
Long stroke silent motor	Black and nickel trim	Effective dash ventilators	Concealed horn
Selective transmission	Metal bodies—24 coats of paint and varnish	Self-starter	Tire carrier and protector
116-inch wheelbase	Roomy tonneau	Stylish Mohair top and side curtains	Extra tire rims
36-inch wheels			

The "40" is made in two body styles. The Touring Car, $1675, and the Roadster, $1625. We also make a "30" Touring Car, $1145, and Roadster, $1110; a "22" Roadster, $785. All cars fully equipped, prices f. o. b. factory.

You should buy a Maxwell because It holds the world's speed record in its class. It is the national touring champion—winner of the Glidden Tour. It lasts longest—proven by actual State registrations. It costs less to maintain—proven by public demonstration.

Deliveries Now Dealers everywhere are prepared to make deliveries at once. We will be glad to send you the advanced Catalogue for 1913. Write for it.

ECONOMY UNITED STATES MOTOR CO UTILITY

United States Motor Company

Maxwell Division

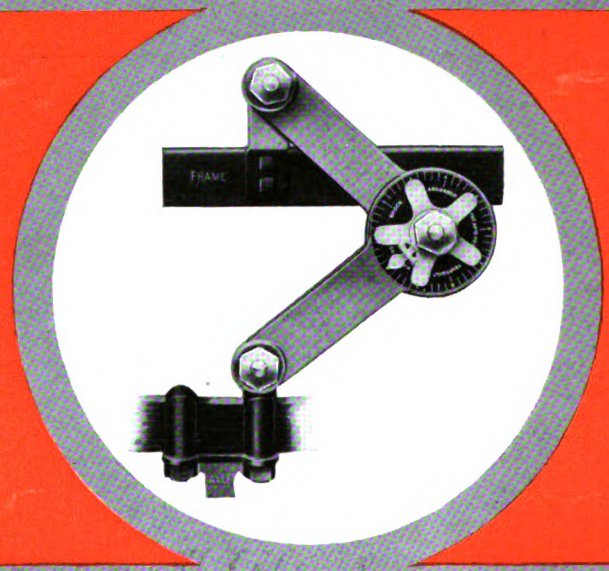
1 West 61st Street New York City

ECONOMY UNITED STATES MOTOR CO UTILITY

Published Weekly by The Motor World Publishing Company, 1600 Broadway, New York

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Truffault-Hartford
SHOCK ABSORBER



Why should YOU pay for equipment that rightly belongs on the car YOU sell?

How often have YOU consented to a demanded piece of equipment to be paid for at your own expense rather than have a dissatisfied customer?

You no more overstep your rights in insisting that the manufacturer YOU represent fully equip his cars at the factory—than do your customers who have learned that certain equipment belongs on every car, to be looked for and demanded.

Thousands of cars come from their factories equipped with the Truffault-Hartford Shock Absorbers in response to a strong, broad, ever-growing demand from car buyers.

Twenty-seven car manufacturers hold that it is essential to complete comfort, safety, and economy—consequently to the very reputation of their product. And they protect their dealers' interests by including it as standard equipment.

YOU are entitled to this consideration from YOUR manufacturer and the right kind of insistence gets it.

HARTFORD SUSPENSION CO. Factory 164 Bay Street **Jersey City, N. J.**

EDW. V. HARTFORD, President

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Franklin Motor Cars

Average

400 Miles to the Gallon of Oil

And many owners of the new series Franklin cars are getting even better results.

This is proof of the superiority of the Franklin re-circulating oiling system:—

And of the high efficiency of Franklin direct cooling.

It is double the average mileage per gallon of oil obtained by owners of water-cooled cars.

You can not get economy in oil consumption without the proper oiling system:—

Nor maximum economy out of any oiling system unless the motor cools properly.

Franklin direct cooling keeps the cylinders at the proper temperature and gets the highest efficiency not only from the oiling system but from the fuel. (Write for folder "They Barred Us Out.")

Franklin re-circulating oiling system delivers a steady stream of oil to each of the main motor bearings through separate leads. It is the only oiling system that feeds oil positively and directly to each of the main bearings.

The amount of oil pumped over the bearings is proportional to the needs of the motor. The faster the motor runs the more oil supplied. This means perfect lubrication under every condition of running.

The oiling system can not become clogged up The minute anything obstructs the passage of oil through any one lead, the pump generates a high pressure sufficient to dislodge the obstruction without injuring the system.

Clean cool oil is always being furnished to the working parts of the motor. As it drains back from the cylinders and engine base into the oil reservoir it strains through a fine mesh screen. 2.4 square feet of straining area for every gallon of oil guarantees sufficient cleaning.

The sight feed on the dash shows the exact amount of oil being delivered to each motor bearing.

There are other mechanical reasons why the Franklin is the most economical and efficient of all motor cars.

Send for booklet "An Analysis of Franklin Motor Car Construction."

FRANKLIN AUTOMOBILE COMPANY

Syracuse N Y

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Mr. Automobilist:

Your tire maker is very anxious to impress upon you the importance of

Tires Inflated to the Right Pressure

He insists that this is tire economy and

Saves You Money

How do you know what pressure you have in your tires? A

SCHRADER
UNIVERSAL
Tire Pressure Gauge

(Trade Mark Registered in U. S. Patent Office)



(Patented March, 1898—Other Patents Pending)

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Price $1.00 Each
Ready for Delivery Now

Guaranteed Simple and Absolutely Accurate

Can be obtained from all tire manufacturers and the dealers, or

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28-32 Rose Street New York City

ADVERTISERS' INDEX

A

Abbott Motor Co.....40-41
Adamson Mfg. Co..... 56
Ajax-Grieb Rubber Co..... 65
American Ball Bearing Co..... 59
American Locomotive Co..... 35
American Motors Co..... 61
American Starter & Carburetor Mfg. Co. 60
Apple Electric Co..... 56
Argo Electric Vehicle Co..... 64
Atwater Kent Mfg. Works..... 39
Automobile Supply Mfg. Co.... 57

B

Badger Brass Mfg. Co..... 60
Baldwin Chain & Mfg. Co..... 52
Bantam Anti-Friction Co..... 59
Barthel, Daly & Miller..... 55
Bartholomew Co. 58
Benz Auto Import Co..... 50
Bosch Magneto Co..... 53
Bossert Co..... 63
Bretz Co., J. S..... 54
Brictson Mfg. Co..... 65
Briggs-Detroiter Co..... 62
Brown-Lipe-Chapin Gear Co... 59
Bush Mfg. Co..... 65

C

Cartercar Co..... 61
Champion Ignition Co..... 57
Champion Spark Plug Co..... 54
Clarke-Carter Automobile Co... 63
Classified Advertising.....66-67
Cole Motor Car Co..... 61
Colonial Electric Car Co..... 60
Consolidated Mfg. Co..... 60
Continental Motor Mfg. Co.... 65
Covert Motor Vehicle Co..... 54

D

Dayton Auto Truck Co..... 60
Dayton Rubber Mfg. Co..... 65
Dean Electric Co..... 38
Detroit & Cleveland Navigation Co. 56
Diamond Chain & Mfg. Co.... 57
Diamond Rubber Co..... 59
Dorris Motor Car Co..... 58
Double-Fabric Tire Co..... 54

E

Electric Welding Products Co.. 48
Empire Automobile Co..... 62

F

Federal Rubber Mfg. Co..... 48
F. I. A. T..... 63
Fire Proof Garage Co..... 65
Firestone Tire & Rubber Co... 59
Fowler Waste Mfg. Co..... 64
Franklin Automobile Co..... 1
Fulton-McCutchan Co..... 65

G

G. C. A. Mfg. Co..... 56
Gilmer, Jr., G. Walker..... 62
Golde Patent Mfg. Co..... 54
Goodyear Tire & Rubber Co., The 65
Grant-Lees Machine Co..... 63
Grossman Co., Emil..... 63

H

Hartford Suspension Co., Inside front cover
Havers Motor Car Co..... 58
Haynes Automobile Co..... 60
Hodge & Graves..... 54
Hupp Motor Car Co..... 61
Hyatt Roller Bearing Co..... 55
Hydraulic Pressed Steel Co.... 55

I

Ideal Motor Car Co..... 54
Inner Shoe Tire Co..... 64
International Harvester Co.... 49
Inter-State Automobile Co..... 62

J

Jeffery-Dewitt Co..... 57
Jencick Motor Corp..... 56
Jones Speedometer..... 56

K

Kellom & Co., Chas F..... 64



Digitized by Google

ADVERTISERS INDEX

elly-Springfield Tire Co..... 65
insey Mfg. Co..... 59
issel Motor Car Co..... 62
line Motor Car Corp..... 61
night-Davidson Co..... 62
nox Automobile Co.....46-47

L

auth-Juergens Motor Car Co.. 55
eather Tire Goods Co..... 65
ocomobile Co..... 64
ovell-McConnell Mfg. Co.,
Inside back cover

M

arion Motor Car Co..... 53
cCue Co..... 44
cGraw Tire & Rubber Co.... 64
& P Electric Vehicle Co.... 62
etz Co..... 63
ichigan Motor Car Co..... 58
iller, Chas. E..... 51
oline Auto Co..... 53
osler & Co., A. R..... 63
oss Photo Engraving Co.... 52
otor Car Equipment Co..... 63
ott Wheel Works..... 56
otz Tire & Rubber Co..... 65
utty Co., L. J..... 64

N

ational-Acme Mfg. Co..... 64
ational Motor Supply Co..... 64
ational Motor Vehicle Co.... 61
ew Departure Mfg. Co..... 60
ew Process Rawhide Co..... 57
iagara Sales Co..... 3
ordyke & Marmon Co..... 62
yberg Automobile Works.... 58

O

akland Motor Car Co..... 58
tho Motor Co..... 64
wen & Co., R. M..... 65

P

enn Spring Works..... 63
erfection Spring Co..... 63
Piel Co., J..... 57
Polson Mfg. Co..... 59
Prest-O-Lite Co..... 65
Pullman Motor Car Co..... 58

R

Rajah Auto Supply Co..... 57
R. C. H. Corp..... 61
Reliance Speedometer Co..... 64
Remy Electric Co..... 50
Republic Rubber Co..... 64
Rhineland Machine Works..... 63
Royal Equipment Co..... 55
Rutenber Motor Co..... 61

S

Sanford Motor Truck Co..... 50
Schrader's Sons, A., Inc..... 2
Shawmut Tire Co..... 60
Sheldon Axle Co..... 68
Sparks-Withington Co..... 65
Speedwell Motor Car Co..... 62
Splitdorf Electrical Co..... 54
Springfield Metal Body Co..... 65
Standard Roller Bearing Co.... 64
Standard Welding Co..... 43
Standard Wheel Co..... 57
Stearns Co., F. B..... 58
Stewart Motor Corporation.... 55
Studebaker Corporation. Back cover

T

Timken Roller Bearing Co..... 45
Tobias, F. H..... 64
Twitchell Gauge Co..... 50

U

United Rim Co..... 56
U. S. Motors Co.....Front cover
United States Tire Co..... 65

W

Warm Hand Steering Wheel Co. 36
Warner Gear Co..... 52
Warner Instrument Co..... 53
Weed Chain Tire Grip Co..... 64
Whitney Mfg. Co..... 49
Willard Storage Battery Co.... 37
Willys-Overland Co., The..... 4

The Niagara

Acetylene Gas and Pure Air

This is the only mixture that should enter the cylinders of your engine through the medium of an engine starter.

If pure acetylene gas be injected into the cylinders of a gas engine, it is bound to foul and soot the spark plugs and reduce the efficiency of the engine.

The Niagara Self Starter

mixes acetylene gas with the proper proportion of pure air before injecting it into the cylinders of your engine.

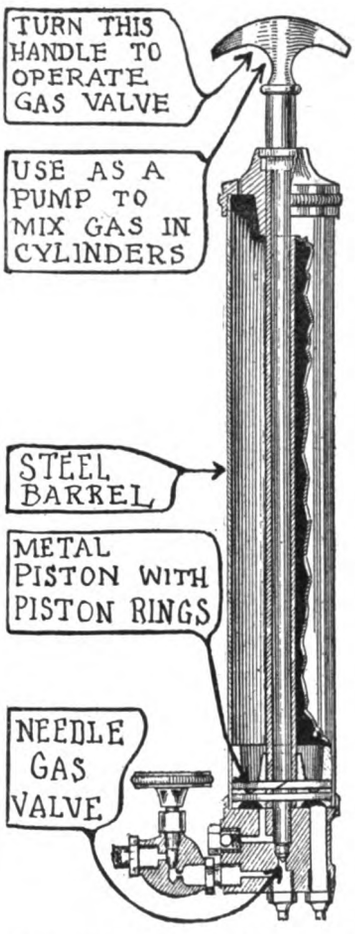
That is why the Niagara Self Starter does not soot and foul the engine plugs—

That is why the Niagara Self Starter is the one self starter that you should sell.

Not only is the Niagara Self Starter built on the proper basic principle but its manufacture and the material used in its manufacture are absolutely right.

Leather washers are dispensed with because they are inefficient. In place of leather washers the compressor of the Niagara starter, shown herewith, is made of seamless drawn steel tubing with a cast iron piston and two cast iron piston rings.

When your car is worn out, take the Niagara starter off and put it on a new car. It will last forever.



We have a splendid proposition for dealers and a manufacturing proposition that is absolutely right. Let us hear from you.

THE NIAGARA SALES COMPANY
Buffalo, New York

Self Starter

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Overland 1913

$985

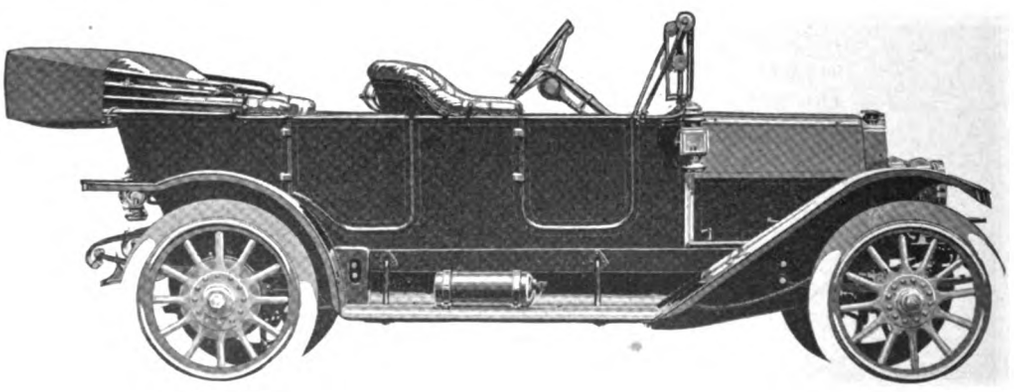
Completely Equipped

You Can Boast of This Car's Price

Self Starter	*Remy Magneto*
30 Horsepower	*Warner Speedometer*
5-Passenger Touring Car	*Mohair Top and Boot*
110-inch Wheel Base	*Clear Vision Wind Shield*
Timken Bearings	*Prestolite Tank*
Center Control	

¶ Check this list carefully. Get the extraordinary value, the result of our preparations to market 40,000 cars. There is not a feature of a $1200 car lacking in this array. With Model 69 T for 1913 we will lead this year's automobile pace. It will go anywhere for the least cost. You can boast of its appearance, efficiency and PRICE. In other words, it is a buy you will be complimented on. A 1913 catalogue will give particulars.

The Willys-Overland Company, Dept. 50, Toledo, Ohio



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THE MOTOR WORLD

Vol. XXXII New York, U. S. A., Thursday, September 19, 1912 No. 13

LEONARD'S TRANSMISSION PATENT ASSUMES INCREASED IMPORTANCE

Settlement of Dyer Litigation Turns Attention to Three-Year-Old Suit of Leonard vs. Lozier—Leonard Claims Basic Right to Four-Speed System and Suggests Dyer Patent is "Too Broad."

Signing of an order last week, by Judge Hough, permitting a change of names of the attorneys of record in the case, served to bring to light the action of H. Ward Leonard, of Bronxville, N. Y., vs. the Lozier Motor Co., which has reposed more or less peacefully in the United States District Court for the Southern District of New York for almost three years. In the suit, Leonard, who was one of the pioneers of the automobile industry, charges the Lozier company with infringement of his patent No. 827,454, dated July 31, 1906, which covers a "variable-speed and reversing gear" which is claimed to be basic so far as concerns direct drive on an intermediate speed. In other words, it applies chiefly to the four-speed system.

At least nine well-known cars are claimed to infringe the patent but the Lozier case is in the nature of a test, and with the recent prominence attained by the Dyer transmission patents, which only last month were recognized by the Automobile Board of Trade, new point and added importance have been given to the Leonard claims. Redding & Greeley, the counsel for the Automobile Board of Trade, who negotiated the settlement with the Dyer interests, are representing Lozier in the Leonard action, and Leonard himself has taken notice of the Dyer patents, but he is sanguine that his grant is the stronger one and that if fought to a finish it will be proved that the Dyer patents are so broad as to be vulnerable.

In this connection, few are aware that the Leonard patent has been sustained by British courts, but such, nevertheless, is the case. In the action across the seas, Leonard sued the makers of the Rolls-Royce car, the designer of which, Rolls, then generally was supposed to be the originator of the gear system covered by the Leonard patents. Leonard, however, proved his case to the satisfaction of the British court and the Rolls-Royce people now are paying him royalty.

While it has slowly dragged through the courts, the Leonard-Lozier suit has not reached beyond the taking-testimony stage. Many reams of it already have been taken and the procedure still is going on. Lozier, of course, attacks the patent on the not uncommon ground that it required no invention, is the product of mere mechanical skill and consists of aggregations of well-known parts. Lozier also has cited a number of prominent men identified with the industry who, it is claimed, were aware of the Lozier invention, and on April 22nd last filed an amended answer adding to the list of such names.

The Leonard transmission has two main features which distinguish it from other sliding types in use today, and while the patent is made up of some 60 claims, the employment of "two axially sliding elements" and a "direct drive on an intermediate speed" constitute the most essential points.

The ordinary sliding transmission, such as is claimed to come within the Dyer patent, has but one sliding element. According to the specifications of the Leonard patent, the direct drive may be placed on any intermediate speed between high and low.

ENGINEER DECLARES OIL COMPANIES CAN LOWER THE PRICE OF GASOLENE

Calorific Expert Maintains "Long Cuts" Quickly Will Relieve Present Situation and Suggests Legislation To Make Relief Permanent—Kerosene Carburetter Best Solution, He Says.

Ask the average man who has to do with the production of petroleum derivatives why the price of gasolene has advanced 78 per cent. in the course of ten months, and his answer comes quick and emphatic: "Supply and demand." He stands firmly and he refuses to budge even when it is pointed out that there is no visible evidence that either the supply has decreased or the demand increased in such proportion, and that the profits of the oil companies are as large, if not larger, than ever before. Asked where lies the avenue of relief, the petroleum producer may ejaculate, "Kerosene," or he merely may shrug his shoulders.

There is at least one known exception to the rule. He is John R. Mack, a calorific engineer, who spent several years in the intimate service of the Texas (Oil) Co., but who more recently struck out on his own account in other directions. It requires but short converse with him to discover that he has petroleum at his finger tips, so to speak.

The fact that the Standard Oil Co. has its engineers engaged in the effort to evolve a practical kerosene carburetter, as exclusively reported by the Motor World last week, indicates that that gigantic corporation believes that kerosene offers the best solution of the problem. Mack himself shares this faith, but, pending the development of such a carburetter, he declares that the market can be relieved immediately, and the supply of gasolene greatly increased, whenever the oil companies see fit

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to do so. The means is within their grasp, and at least one of them already has grasped it. This company could well afford to sell the fuel for 9 or 10 cents but apparently as the "other fellows" can get 16 cents, it gets it too, possibly influenced by the likelihood that if it undersells the market, its rivals may bring down the prices on road oil, bitumen and other such by-products which are the most profitable of the derivatives of petroleum.

"Long cuts," as they are termed in the petroleum industry, afford the solution, which, according to Mack, is immediately available.

How "Long Cuts" Afford a Solution.

Gasolene or naphtha, as is well known, is distilled from crude benzine, which is distilled from crude oil. The crude benzine is placed in stills which are heated by steam; as the vapors pass over they are condensed. This condensation is divided as it comes from the condensor, into "fractions" or "cuts." The first fractions being very volatile are called the "light end" and the latter the "heavy end." Mack maintains that by making a long cut from the light end down to say a Baume gravity of 54 degrees it would serve the purpose. This "long cut" must embody all of the fractions of the distillate in their order, the light and volatile parts taking care of the quick ignition of the charge while the heavy end will take care of the expansion so necessary to the operation of automobile engines.

A long cut with none of the intermediate fractions having been drawn off, immediately will so greatly increase the production of automobile fuel that it will make possible a price more nearly approximating that which obtained less than a year ago, when nine cents per gallon was the prevailing rate. If the oil companies will not adopt this measure of relief, Mack states that there is a way of forcing them to do so, and a way that would serve so many good purposes that it appears worth while.

Suggests Legislation as Remedy.

"It was the law which compelled the production of fuel at a certain specified flash test that is directly responsible for the uniformity of the kerosene which can be obtained today at almost any grocery store in any part of the country," said Mack in outlining his views, "and whenever a similar law is brought to bear on gasolene the same result will be obtained. Flash tests will prove abundantly that 64 degrees gasolene is ample for practical purposes, and if the law permits the sale of no other motor fuel the producers quickly will be brought into line. It means not only a greatly increased supply and a much lower price, but it will mean also that wherever gasolene is used or handled the element of safety will be very measurably increased."

(Continued on page 20.)

TO BUILD COMPLETE CHASSIS FOR TRADE

Company Formed in Detroit to Develop a Little-Worked Field—The Men Who Are Interested and the Product Planned.

To meet in a large way a demand which undoubtedly exists and which at best has been indifferently met, the Detroit Motor Chassis Co. has been organized in the Michigan city of that name, to supply complete chassis to carriage builders and other persons who desire to supply bodies and equipment and market complete cars under their own names.

The new company, which has been capitalized at $25,000 under the laws of Michigan, has for its officers four men who are not strange to the automobile industry. They are: President, A. J. Kinucan, who has been connected with several Detroit automobile factories; vice-president, M. C. Dewitt, of the Jeffery-Dewitt Co.; secretary, L. J. Stringer, formerly connected with the Hudson Motor Car Co.; treasurer, William P. Culver, of the Culver-Taylor Chain Co.

The plans of the company already are so well advanced that a plant has been established at 960 Champlain street, in Detroit, from which first deliveries will be made about November 1st.

The Detroit chassis will utilize a four-cylinder motor of approximately 37 horsepower, the engine dimensions being 4¼ bore by 4¾ stroke. It will have a three-bearing crankshaft and Warner sliding transmission, three speeds forward and reverse. The clutch, which is incorporated as a unit in the motor, is of the multiple disk type running in oil; the rear axle is Weston-Mott standard ¾ floating type; frame is of pressed steel; front springs semi-elliptical, 38 x 1¼ inches; rear springs ¾ elliptic, 52 x 2 inches. Control will be right, left or center at the option of the purchaser.

Garagemen to Incorporate Association.

Carrying out the sentiment expressed at the New York garage owner's dinner on the 10th inst., the committee of 15, which was appointed for the purpose, has adopted a plan of organization for what will be styled the New York Garage Association. It will be incorporated this week with capital of $2,000, the par value of each share being $10. Each member's holdings will be limited to one share. C. H. Potter, L. Joscelyn and J. Burrows, all of whom were leaders in the movement, will figure as corporators of the new association, which will meet next week—probably on Thursday—to elect officers and 15 directors and otherwise complete the organization and shape its working plan.

For the present, it is the purpose of the organization to devote itself to the effort to relieve the gasolene situation, a measure of which at least is possible because of the proposal of one of the oil companies to supply gasolene to the members at a slightly lower rate in consideration of a blanket contract.

Canadian Dealer on Financial Shoals.

Reports from Winnipeg, Man., that Robert G. Larimer, vice-president and treasurer and active manager of the Larimer Co Ltd., which represented the Detroit electric, had left that city leaving behind a trail of notes and other debts amounting to $100,000 are declared by the Anderson Electric Car Co., of Detroit, which makes the Detroit electric, to be grossly exaggerated. The Anderson company states that it has investigated his affairs, and while Larimer was found financially embarrassed by liabilities of about $33,000, his available assets are about $40,000, and that everything has been set right, at least so far as the Anderson company is concerned. Before leaving Winnipeg, it is stated that Larimer mortgaged his garage and all its contents and that the mortgagee, one T. J. Murray, is in possession.

Benz Increases Capital and Dividends.

Benz & Co., of Mannheim, Germany, who make the famous car of that name, have increased their annual dividend from 8 to 10 per cent. and their capital stock from $1,000,000 to $4,000,000. Of the new shares, which will be taken over by a group of bankers, $750,000 will be offered for subscription to present shareholders at a price of 160 per cent. and in the proportion of one new share to four old ones. At the general meeting of the Benz company at which these things were done, it was brought out that the orders then in hand were three times larger than they were at the same time last year.

Marvel Completes Removal to Flint.

The Marvel Carburetter Co., which recently accepted a proposal made by the Board of Commerce of Flint, Mich., to remove its plant to that city from Indianapolis, Ind., has completed the task and now is installed in a plant on Mill street in Flint. It is a three-story structure, 50 x 150 feet, which will permit a total output of 300 carburetters a day. Several of Flint's substantial business men have become financially interested in the Marvel company, the management of which, however, remains in the hands of A. G. Schonacker.

Flanders Contemplating a Bond Issue.

A special meeting of the stockholders of the Flanders Mfg. Co., of Pontiac, Mich., has been called to occur on Wednesday next, 25th inst. At that time the issuance of a mortgage bond issue will be considered among other things.

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TOCKHOLDER PROTESTS GRABOWSKY'S SALE

ks Court to Prohibit Contemplated Sale by Creditors' Committee—Claims Interests of Stockholders Not Considered.

Because of allegations made by John C. nble, a stockholder, to the effect that committee of creditors which has conlled and directed the affairs of the Grawsky Power Wagon Co., of Detroit, ch., for several months past is about to pose of the property at a sacrifice, the ayne County Chancery Court in Deit, on Tuesday last, 17th inst., granted order temporarily restraining the com:tee from taking such action; the order :eturnable today.

When the Grabowsky company ran into ubled water last winter, and its debts unted to some $350,000, its creditors ne to its assistance and to relieve the :ssure a committee was appointed first advise and later to take over and con:t the business, the directors of the com:y at the latter stage of the proceedings nsferring their stock to the members of committee, who were named voting stees. All of them, save one, are promiit personages in the trade, to wit.: Har- S. Firestone, B. F. Tobin, H. W. apin, George H. Russell, W. K. Prudden l B. Ginsburg.

In his complaint, Kimble bears witness to character of the committeemen, but he :lares that as their time and business eps them away from the Grabowsky of- they have left the business in the hands a manager, to its detriment, and are, :refore, anxious to rid themselves of the rden.

Since the committee assumed charge, mble states that creditors have been id 20 per cent. of their accounts, or an gregate of $90,000, and that there is sufient cash on hand to permit of another ridend, the exact amount of which he es not know. He alleges that on August last, the Grabowsky assets amounted to 74,503 and the liabilities to about $400,-), a situation which, if properly managed, believes would result in payment of the isting indebtedness and the turning back the business to members of the corpotion. Instead of seeking to achieve that d, however, Kimble avers that the comittee of creditors have offered the business for sale and have received an offer of 60,000 for the plant and the equipment, nich price, in his opinion, constitutes a crifice. He adds that he appealed to the ard of directors of the Grabowsky comny to bring action restraining the sale the plant, but that individual directors refused to do so, claiming that having turned their property over to the committee of creditors they no longer have authority to act for the corporation or its stockholders.

Incidentally, Kimble complains that the stockholders of the company were not permitted any voice in the appointment of the committee of creditors and voting trustees, and that no meeting of stockholders ever was called to ratify the agreement.

Believing that the committee has conducted the business not in the interests of the stockholders, "but always with a view of realizing as much as possible out of the merchandise and stock," Kimble not only asks for an injunction restraining the threatened sale of the property but also applies for the appointment of a receiver to protect the interests of the stockholders and to dissolve the corporation and distribute the proceeds.

Set-Screw Cause of Lamp Maker's Suit.

Where the set-screws which hold an automobile headlight to the bracket are located may not be considered of great importance, but it is sufficient to be the basis of a suit which this week was commenced in the United States District Court for the Southern District of New York by the DuBois Safety Lamp Co., of New York City, against Gray & Davis, Inc., of Amesbury, Mass., and of New York City. The action is for alleged infringement of patent No. 919,837, which was granted to R. G. DuBois, of South Orange, N. J., April 27, 1909, and which covers a lamp bracket. The bracket in question is so constructed that the set-screws which hold the lamp firmly in position on the bracket are inside the lamp. To turn them the front of the lamp must be opened, but the advantage claimed is that a person cranking the car will not tear his or her clothing on the projecting screws, as might be the case were they outside. The patent now is owned by the DuBois company.

Court Orders King Assets Auctioned.

By order of the court, the assets of the King Motor Car Co., of Detroit, will be offered at public sale on September 28th. A. Ward, of Ward & Gow, New York, who was a creditor to the extent of $100,000, offered $40,000 for the property, but F. E. Wadsworth, who operates the Detroit Motor Car Supply Co., the Detroit Engine Works and several other marine motor concerns, gave notice that he also desires to submit a bid, but before doing so he asked for an appraisal, which will be ready by the 28th inst. Meanwhile, under orders of the receiver, Lathrop Collins is acting as general manager of the King company.

Clarke-Carter Becomes Cutting Company.

The Clarke-Carter Automobile Co., of Jackson, Mich., makers of the Cutting car, has changed its title to the Cutting Motor Car Co. .The personnel of the company, however, remains unchanged.

RECEIVERSHIP ASSISTS U. S. REORGANIZATION

All Plants Operating and Reorganization May Be Effected Within One Month—Caustic Comment on Big Corporation's Failure.

Doubtless because knowledge of its financial straits was so widespread, the appointment of receivers for the United States Motor Co. late Wednesday evening of last week, 11th inst., failed to create any marked disturbance in the trade. The failure, as the Motor World stated, was not unexpected, the hour at which the application for the receiver was filed at 9 P. M., being the most unusual feature of the case.

The action, which took the form of a suit in equity and not a petition in bankruptcy, will prove a short cut toward the reorganization which had been in process some three months, and will permit it to be effected without harassment on the part of dissatisfied creditors and without the presence of sheriffs' keepers, several of whom had levied attachments on the appointments of the general office in New York which were the only property assets on which levies could be made.

Following their appointment as receivers for the parent company, W. E. S. Strong and Roberts Walker have been appointed receivers also for the several subsidiary companies, to wit.: The Maxwell-Briscoe Motor Co., which has plants in Tarrytown, N. Y., Auburn, R. I., and Newcastle, Ind.; the Brush Runabout Co. and the Alden Sampson Mfg. Co., of Detroit; the Columbia Motor Car Co., of Hartford, Conn., and the Dayton Motor Car Co., of Dayton, O.

As a direct result of the failure, James M. Scott, Richard A. Robertson and Harvey A. Bacon were named receivers for the Providence Engineering Works, of Providence, R. I., which is affiliated with the United States Motor Co., but which was not named in the suit in equity brought in the Federal court in New York by the Brown & Sharpe Mfg. Co., whose action brought matters to a head. The receivership proceedings against the Providence Engineering Works were instituted by the Industrial Trust Co., of that city, which holds promissory notes for $66,996.

The Briscoe Mfg. Co., in Detroit, which makes radiators and other parts, is not affected by the receivership. Although it is identified with the United States company, it develops that the Briscoe stock is held on a basis different from the companies which were included in the receivership.

Meanwhile the various plants continue in operation and the Federal court has authorized the receivers to advance money of the

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United States Motor Co. to meet the running expenses of the Maxwell-Briscoe, Columbia and Alden Sampson companies, the money to be charged against the three recipients at 6 per cent. and to constitute a lien against their assets and property. The receivers also were directed to cause repayment of the money as soon as it can be secured.

No schedule of assets or liabilities yet has been filed, but according to the merchandise creditors' committee, which is composed of the members of the Motor and Accessory Manufacturers, Inc., the total liabilities are about $12,000,000, of which $4,000,000 is due the banks and about $2,000,000 for merchandise; the remainder is owed to the debenture bond holders who have no security whatever. The quick assets, which include complete automobiles and parts thereof, amount to about $9,250,000, factories and equipment to about $6,250,000 and stocks in subsidiary companies to about $6,200,000. The merchandise creditors' committee was in full sympathy with the receivership proceedings.

Frederick Drew Bond, of 15 Broad street, New York, has issued a call for the formation of a protective committee of holders of United States Motor shares, but exactly what he has in view cannot be learned. When sought he could not be found, and at his address in Broad street it was stated that he spends only a few minutes there each day.

According to a representative of the reorganization committee, the reorganization probably will be effected within a month. It is generally understood that the plan calls for a substantial scaling down of the present capitalization of $42,500,000 and for the levying of an assessment of $25 on the preferred shares and $10 on the common; also for the discontinuance of at least two factories.

Immediately preceding and immediately following the failure of the big corporation, several sensational stories appeared in print which permitted to be inferred that financial wrongdoing had been committed and more or less stock-jobbery perpetrated, but all of those who are in position to speak by the book agree in stating that charges of malfeasance or dishonesty of any sort are wholly without foundation. That the company was over-capitalized and was doing too much business for its capital is well known; and that there have been lapses in management is undoubted, a fact which has given rise to some caustic comment on the part of certain of the bankers who interested themselves in the effort to straighten out the company's affairs. "Wretched inefficiency" is the term which one of them employed in describing the state of affairs which he found existing in all save three factories. He added that there had been much waste and loss through "placing in executive positions men who but a few years ago were machinists."

It is not wholly a secret that several departments of the company had been seriously embarrassed by this state of affairs. The friction that comes of gathering into one big company former rivals who previously had dominated absolutely their respective establishments was not lacking in the United States Motor Co. and did not make easier its going. It caused not only friction but considerable firing at cross-purposes, both in the executive and manufacturing departments. As one of the heads of departments recently described it to a Motor World man, "We have had the devil's own time trying to induce the factories to produce goods that are not merely easy to make but easy to sell."

Changes Among Prominent Tradesmen.

D. C. Coughlin has resigned the management of the Prest-O-Lite branch in Cincinnati, where he has been stationed for two years. His successor has not yet been named.

John M. Stockfisch has been appointed New York division manager of the Texas Oil Co. in New York City. Previously he occupied a similar post in the Havoline Oil Co.

A. G. Seiberling has tendered his resignation as secretary and treasurer of the Apperson Bros. Automobile Co., of Kokomo, Ind. He will remain in office, however, until his successor is selected.

Louis M. Pawlet has resigned the post of executive engineer of the Locomobile Co. of America to go into business on his own account. He has set up in the United States Rubber building, in New York City, as a consulting engineer, with special reference to automobile subjects.

Because of ill health, C. E. Havens has resigned as manager of the technical service department of the Abbott Motor Co., of Detroit, and will spend some time in the woods of northern Michigan in an effort to recuperate. When his health is recovered, Havens expects to return to the same line of work.

F. M. Prendergast, manager of the Foss-Hughes Co.'s Newport (R. I.) branch, has been transferred to the management of the new branch which that company just has opened in Washington, D. C., at 1220 Connecticut avenue. The Foss-Hughes Co. handles the Pierce-Arrow in several other automobile centers in the East.

Richard Everett has been appointed sales manager of the Royal Equipment Co., of Bridgeport, Conn., to fill the vacancy caused by the resignation of Royal B. Curtiss, who recently became a district manager for the Chase Motor Truck Co. Previous to joining the Royal Equipment staff, Everett was sales manager for the R. E. Dietz Co., of New York.

C. W. Sedwick has been appointed manager of the Indianapolis motor speedway, succeeding C. E. Shuart, who recently became a free lance promoter. Sedwick is a member of the stock brokerage firm of Sedwick Sons & Co., of Indianapolis, and is best known to the automobile interests because of his office as Indiana representative of the contest board of the American Automobile Association.

E. J. Kilbourn, manager of the Mitchell Motor Co.'s Kansas City branch, has resigned that position to become identified with the executive department of the General Motors Truck Co., of Pontiac, Mich. In this respect, he is following his former chief, W. L. Day, who recently relinquished the sales management of the Mitchell company to become general manager of the General Motors Truck interests.

J. V. Campbell, manager of the Colby Car Co.'s branch in Minneapolis, has been called to the factory at Mason City, Iowa, where he henceforth will serve as sales manager. His former duties in Minneapolis will be shared by Henry and Albert Walch and Leroy Werges, who formerly sold Colby cars in Monona, Iowa. Two of them will travel Minnesota and the Dakotas, Montana, Canada and northwestern Wisconsin, while the other will be stationed at the Minneapolis branch.

Kelsey Renews Motorette at Lower Price.

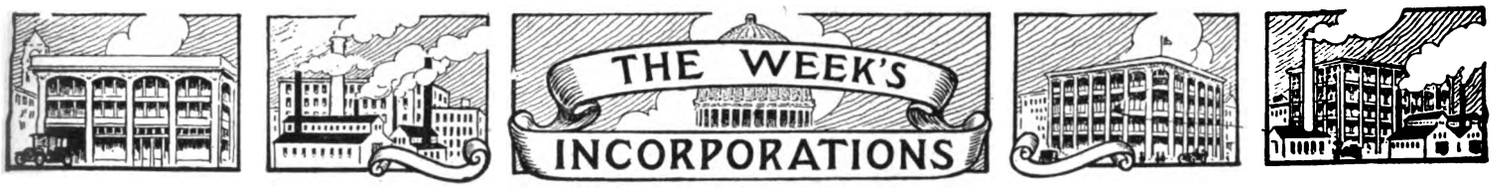
Having acquired the property of the old company, which bore practically the same name, C. W. Kelsey, under the style Kelsey Motor Co., and with undiminished faith and energy, has recommenced the manufacture of the Kelsey three-wheel Motorette in Hartford, Conn. The new company is not incorporated. Its general management is vested in Kelsey himself. It is occupying the factory of the original concern and the manufacture of 300 cars is in process.

The new Motorette includes practically all of the features possessed by the original vehicle, the chief point of difference being in the engine, a four-cylinder, 11 horsepower motor having been substituted for the two-cycle engine previously employed. It is of the opposed type with mechanically operated valves, all enclosed, and is cooled by the thermo-syphon system. It is built on the same principle as a four-cylinder engine, having a sub-base in which the oil is contained. The oil is circulated by means of a small gear pump which lubricates the connecting rod bearings and piston and returns downward through a strainer to the sub-base. The ignition is by Bosch magneto. Despite the improvements, the price of the Motorette has been reduced to $350.

Anderson Takes Over Boston Agency.

The Anderson Electric Car Co., of Detroit, manufacturer of Detroit electrics, has taken over its agency interests in Boston which hereafter will be conducted as a factory branch. The former location, 36 Boylston street, will be retained. Albert Weatherbee, who has been identified with the Detroit Electric interests of New York, will manage the new Boston branch.

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Rockford, Ill.—Overland Automobile Co., under Illinois laws, with $10,000 capital; to deal in motor cars.

Marietta, Ohio—Gerhart Spring Tire Co., under Ohio laws, with $15,000 capital; to manufacture spring tires.

Columbus, O.—Bond Hill Auto Service Co., under Ohio laws, with $2,000 capital; to operate motor vehicle service.

Kalamazoo, Mich.—Kalamazoo Auto Sales Co., under Michigan laws, with $12,000 capital ;to deal in motor cars.

Middletown, Ohio—Crescent Motor Truck Co., under Ohio laws, with $100,000 capital; to manufacture motor trucks.

Macon, Ga.—Wade Garage Co., under Georgia laws, with $12,000 capital; to operate a garage. Corporators—Edward T. Wadley.

Little Rock, Ark.—Newsum Auto Tire Vulcanizing Co., under Arkansas laws, with $10,000 capital; to deal in and repair motor car tires.

Beverly, Mass.—Cameron Mfg. Co., under Massachusetts laws, with $300,000 capital; to manufacture motor cars. Corporators—Everett S Cameron and others.

Macon, Ga.—Essenkay Sales Co., under Georgia laws, with $22,000 capital; to deal in tire filler. Corporators—John S. Schofield, W. A. Chapman and others.

Seattle, Wash.—Buick Automobile Co. of Seattle, under Washington laws, with $10,000 capital; to deal in motor cars. Corporators—A. S. Eldridge, Mel G. Johnson.

Benton, Ill.—Benton Motor Car Co., under Illinois laws, with $75,000 capital; to deal in motor cars. Corporators—Harry Stotlar, W. S. Cantrell, A. H. Fraunfelder.

Savannah, Ga.—Savannah Auto Repair Co., under Georgia laws, with $10,000 capital; to operate a motor vehicle repair shop. Corporators—W. T. DeBorde, Shelby Myrick.

Grand Rapids, Mich.—Page Corporation, under Michigan laws, with $10,000 capital; to deal in motor cars. Corporators—William J. Page, Clarence E. Bigelow, George H. Hand.

Louisville, Ky.—George H. Weller Co., under Kentucky laws, with $5,000 capital; to deal in motor cars. Corporators—George H. Weller, Sallie J. Brown, Mary S. Howard.

Boston, Mass.—Motor Service Co., under Massachusetts laws, with $2,500 capital; to operate a motor service. Corporators—Sanford Small, Harold D. Chisholm, William H. Evans.

Dunkirk, N. Y.—Dunkirk Specialty Co., under New York laws, with $5,000 capital; to deal in motor supplies. Corporators—Bertram C. Candee, Seth B. Culver, Justus M. Henderson.

Stillwater, Minn.—Republic Motor Co., under Minnesota laws, with $1,000,000 capital; to manufacture motor cars. Corporators—Paul H. Guilford, G. H. Sullivan, L. L. Manswaring.

Kansas City, Mo.—Transcontinental Tire Co., under Missouri laws, with $10,000 capital; to manufacture motor car tires. Corporators—James Chappelle, E. L. Thompson, C. H. Alexander.

St. Louis, Mo.—Kaufman Motor Truck Co., under Missouri laws, with $15,000 capital; to deal in motor vehicles. Corporators—Edward Kaufman, George H. Muehling Norman H. Sadler.

Port Chester, N. Y.—Lowden & Flint's Garage, Inc., under New York laws, with $3,000 capital; to operate a garage. Corporators—Clifford H. Flint, Grace M. Flint, Arthur B. Lowden.

Wellsburg, W. Va.—Brooks Auto Co., under West Virginia laws, with $10,000 capital; to deal in motor cars. Corporators—J. H. Scott, W. H. Scott, C. M. Magee, F. W. Chapman, E. W. Fagan.

Albany, N. Y.—Empire Essenkay Co., under New York laws, with $10,000 capital; to deal in tire filler. Corporators—Herman C. Cowen, John W. Cumming, Howard C. Wilbur, all of Catskill, N. Y.

Rochester, N. Y.—Automobile Safety Fender Co., under New York laws, with $100,000 capital; to manufacture motor car devices. Corporators—William A .Snyder, Jr., Abram DeWolf, and others.

Providence, R. I.—A. W. Harris Oil Co., under Rhode Island laws, with $75,000 capital; to manufacture and deal in lubricants. Corporators—Benjamin S. Terry, Arthur D. Greene, George F. Heywood.

Omaha, Neb.—Western Auto Sales and Mfg. Co., under Nebraska laws, with $50,000 capital; to manufacture motor car parts and deal in motor cars. Corporators—A. W Gilman, A. W. Cole, M. M. Searles.

Grafton, W. Va.—Grafton Motor Car Co., under West Virginia laws, with $5,000 capital; to deal in motor cars. Corporators—Henry J. Pracht, H. D. Comerford, J. Howard Reynolds, A. R. Kunst, D. C. Peck.

New York, N. Y.—Simplex Carburetter Co., under New York laws, with $150,000 capital; to manufacture carburetters. Corporators—Albert L. Kull, Colcord Upton and Simon Mayer, all of 1731 Broadway.

Ft. Worth, Tex.—Nopatch Tire Filler Co., under Texas laws, with $110,000 capital; to manufacture tire filler. Corporators—J. A. Reynolds, N. M. Pressly, H. B. Lyne, James Harrison, W. M. Harrison.

Brooklyn, N. Y.—Haas Garage Co., under New York laws, with $2,000 capital; to operate a garage. Corporators—Louis Haas, Amityville, N. Y.; Emma Haas and Oscar Hauman, both of Babylon, N. Y.

Buffalo, N. Y.—Buffalo Resilio Co., under New York laws, with $25,000 capital; to manufacture and deal in tire filler. Corporators—Stafford D. Noble, Alexander D Falck, Philip D. Lonergan, all of Elmira, N. Y.

Cincinnati, Ohio—Bond Hill Auto Service Co., under Ohio laws, with $2,000 capital; to operate an automobile livery. Corporators—Jacob Glos, John F. Ahlers, Jos. Ahlinghouse, Arthur Pohlman, W. A. Earls.

Kansas City, Mo.—Rambler Distributing Agency, under Missouri laws, with $10,000 capital; to deal in motor cars. Corporators—Edgar C. Ellis, George D. McIlraith, Roy K. Dietricht, Hale H. Cook, Raymond C. Bernett.

New York, N. Y.—Whyle S. Merritt Co., under New York laws, with $10,000 capital; to deal in motors. Corporators—Paul Thamm, 541 First avenue; Seneca W. Merritt, Clyde V. Morse, both of 311 West 59th street.

Cleveland, O.—Northern Ohio Automobile Racing Co., under Ohio laws, with $1,000 capital; to promote automobile races. Corporators—Richard H. Lee, Florence Cawood, John A. Alburn, H. E. Weffler, Fred Hackley.

Recent Losses by Fire.

Martinsburg, W. Va.—Stewart Vehicle Works, complete destroyed. Loss, $150,000.

Portland, Ore.—Robinson & Courser, 266 11th street, garage, accessory stock and six cars destroyed. Loss, $18,500.

Brooklyn, N. Y.—I. S. Remsen, Locomobile Garage, 1410 Bedford avenue, garage partly destroyed. Loss, unknown.

Changes of Corporate Name.

Buffalo, N. Y.—Baker Bros. Motor Car Co. to Cole Motor Co.

Toronto, Ont.—Provincial Motors, Ltd., to Cole Motor Car Co.

Dallas, Tex.—Stafford Illuminated Automobile Lamp & Number Co. from $25,000 to $50,000.

Changes in Capitalization.

Detroit, Mich.—Hupp Motor Car Co. from $500,000 to $750,000.

Jackson, Mich.—Baker Drop Forge Co. from $100,000 to $130,000.

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CREDITORS SEEKING USED CAR MERCHANT

Carry Away What Cars Remain After New Yorker Closes Up—Lawyer Gets Into Queer Mix-Up in Unusual Manner.

Although the Motor Car Exchange, Inc., for nearly two years did a more or less thriving business at 250 West 54th street, New York City, the place today is barren of cars, furniture and proprietors, and while three judgments have been entered in the New York county clerk's office within the past few days, there are said to be numerous other creditors who are seeking to interview Frederick F. Goodman, the once busy proprietor and head of the company. Those who know Goodman express the belief that he still is in New York City but is lying low because of rumors that legal proceedings have been instituted against him. Meantime, J. Lester Fierman, an attorney, of 246 West 59th street, who lately acted as secretary of the concern, is submerged in a sea of trouble from which he states he would only too gladly be extracted.

Goodman incorporated January 23, 1911, to trade in used cars, and is said to have taken many of them on consignment or to have paid for them with notes; when payment was demanded and cash apparently was not available. This, at least, is why the Stein Tire & Rubber Co. entered a judgment for $740.35 and the Gotham Motor Car Co. a judgment for $763.91. There is also a judgment for $425.20 as the result of another note which is held by William Wallach.

Fierman stated that up to Tuesday of last week, 30th inst., Goodman was at the place of business, but that on that day he left and Fierman declares he since has not been able to locate him. Incidentally there appeared a half hundred or more people, so Fierman says, who claimed the Exchange was indebted to them for cars. Said Fierman, "Anyone who had any kind of a legitimate claim to a car took a car. There were about twenty, and there were claimants enough for sixty. I closed up the business and today (Wednesday, 18th inst.) when the landlord threatened to dispossess the company I sold the furniture rather than have it made worthless by being put out in the rain.

"I am sorry I ever was connected with the business. I was attorney for some of the creditors, and when I went to Goodman about our account he said he would make me secretary so I could see what shape the business was in. That is my sole connection with the affair, although I am taking a big share of the criticism. I have been informed that Goodman is in New York and will come back and face the situation, and all I can say is that I sincerely wish he would do so. I've had enough of it."

In the turmoil following the closing up of the Exchange deputy sheriffs replevined for David Lindenborn, a Mercedes valued at $1,300, for James F. Hunter; a car valued at $1,000, and for Scalzo Bros. a truck valued at $600. The corporation's capital stock was $5,000.

Glover to Make Tops and Covers.

Frank L. Glover, formerly identified with the R. J. Irwin Co. and the Gates Mfg. Co., of Indianapolis, has been elected president and general manager of the Glover Equipment Co., which has been organized under the laws of Indiana with $20,000 capital stock for the purpose of manufacturing automobile tops, seat covers and similar goods. The other officers of the company are: Leonard Geiger, vice-president; William Umphrey, treasurer, and Louis Libking, secretary. Temporarily the company has established itself at 142 West Market street, Indianapolis.

To Make Lock Washers in Bridgeport.

Including in its makeup several men who already are identified with the manufacture of automobile specialties, the Universal Lock Washer Co. has been organized in Bridgeport, Conn., to manufacture a simple but ingenious device of the sort indicated by its title. Its officers are: Charles F. Corning, president; E. B. Shoemaker, vice-president; William C. Schmeisser, secretary; B. S. Coe, treasurer. A New York selling office has been established at 6 Church street, of which Vice-president Shoemaker will be in charge.

Everett Seeks Site for Electric Plant.

William R. Everett, who previously was identified with the Economy Motor Car Co., of Joliet, Ill., which became financially embarrassed, is endeavoring to attract capital and secure a factory site elsewhere which will permit of the manufacture of a popular priced electric vehicle which he has ready for development. Everett made a bid for the Economy plant when it was offered at public sale, but the sum he tendered was not high enough. Valparaiso, Ind., is one of the cities with which he now is flirting.

Huge Dividends From Dunlop Tires.

In the course of the recent absorption by the Dunlop Rubber Co. of the Dunlop Pneumatic Tire Co., which was largely in the nature of the great British tire manufacturing company taking over its own sales department, it came out that the sales profits for the past eight years had averaged $1,110,000. Out of these profits, the company has paid average annual cash dividends of 80 per cent., to say nothing of the "bonus shares" which were issued during that period.

TWO TRUCK COMPANIES ARE BADLY ENTANGLED

Suits and Countersuits Mark Their Relations—Officers Are Charged With Mismanagement and Stockholders Are Sued.

Already much mixed, the affairs of the Van-L Commercial Car Co. and the Commercial Service Truck Co., of Grand Haven, Mich., have become so badly entangled that they are becoming difficult to follow. Of several moves and countermoves, the most recent was made last week when John W. Landman, and five other officers of the Commercial Service company, were cited to answer charges of mismanagement and misappropriation of property of the company, while two stockholders were sued for $50,000 each, the amount of their unpaid stock subscription. The complainant in the action is Eugene Carpenter, who is an attorney.

On the face of things, the Commercial Service Truck Co., which was organized in March last with $175,000 capital stock and Philip Moran as president, took over the Van-L concern soon afterward. The transfer, however, was disputed in June, when J. W. Landman and two others applied to the Federal court for the appointment of a receiver, alleging that the transfer of Van-L assets was without authority or consideration and in fraud of Van-L creditors and stockholders. In response to this petition a referee was appointed, but it was only last week that the naming of a receiver took place.

In the meantime, Landman appears to have made his peace with the Commercial Service Truck Co., for, as stated, he now figures a defendant in the action which has for its object the appointment of a receiver for that concern. Of the officers who, with Landman, are accused of mismanagement, it is specifically alleged, among other things, that a number of them not very long ago entered the company's factory, helped themselves to a portion of the property that was there and proceeded to carry it away with them.

Henry R. Brink and Harry J. Hagan are the two Commercial Service stockholders who it is charged have failed to pay their stock subscriptions of $50,000. The charge against them is made a part of the complaint against Landman and the other officers.

Previous to the appointment of a receiver for the Van-L company last week, its schedule was filed with the referee, showing no assets and liabilities of $119,023.74. The absence of assets was explained by the transfer of the Van-L property to the Commercial Service Truck Co.

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F. B. Whyers is about to build a garage Lodi, Cal.

Arthur Moyses has opened a garage in wasso, Mich.

H. L. Garton has opened a garage in nterville, Ia.

John Bendle is about to open a garage in otection, Kan.

Henry Weisenborn is about to erect a rage in Hamilton, O.

Henry Golden is preparing to build a rage in Taunton, Mass.

David Roberts has commenced the construction of a garage in Dickinson, N. D.

C. M. Mather has purchased two lots in arksville, Ia., on which he will erect a rage.

Louis Brudl, of New Haven, Ind., has ld his garage business to George W. illock.

Glen J. Lemaster, of Ottawa, Kan., has ld the Lemaster Garage to William P. ague.

John C. Stolt has purchased a building Nicollet, Minn., and will remodel it for garage.

H. B. Logan has bought a site and will ild a one-story brick garage at 6049-51 ma, Cal.

A three-story garage, 72 x 100 feet, is to e erected in Asheville, N. C., by J. B. umbough.

A garage is to be built in Eagle Grove, a., by Howard Mountford and Mayor Vadsworth.

F. Ostendorf, of Beach Haven, Pa., has lans prepared for a garage; it will be 00 x 200 feet.

E. C. Eads, of St. Joseph, Mo., has entered the field in that city as Regal and Lozier dealer.

William Steinhardt has entered the selling field in San Antonio, Tex. He has the Hudson agency.

Main Street Garage Co. is the style of a new business in Pullman, Wash. A. L. Reid is manager.

The Purdy Garage Co., of Kenosha, Wis., has changed its name to Wahlberg & Nelson Garage Co.

Ira N. Thompson has opened a garage in Columbus, O., at 145 North Fifth street; it will store 36 cars.

Roy Beechler, of Sac City, Ia., has purchased from his father a half interest in the Beechler Auto Co.

Walter Calvert has opened an automobile brokerage office in Lompoc, Cal. He will buy and sell used cars.

Caleb L. McKee is about to have a garage built on North Fourth street, Columbus, O. It will cost $5,000.

Fred Hamlin, who opened a garage in Birmingham, Mich., several months ago, has sold out to Walter Nichols.

The Motor Transfer Co. has been organized in Raleigh, N. C. It will operate a delivery and transfer service.

D. L. Lundgren, of Brennan, N. D., has established a garage and machine shop in New Rockford, in the same state.

Harry Bernhard, of Pasadena, Cal., has sold his interests in the Chalmers Garage to Taylor, Osgoodsby & Eastman.

Walter E. Blake, owner of the Palace Stables in Ansonia, Conn., is converting a part of his buildings into a garage.

The Provincial Motors, Ltd., of Toronto, Ont., has changed its name to Cole Motor Car Co. The company is Cole agent.

O. C. Russell has commenced the construction of a garage in Truro, Ia. He is also the owner of a blacksmith shop.

Federal Auto Accessories Co. is the style of a new concern in Columbus. Its offices are in the Union National Bank building.

Ferdinand Huber is about to open a garage, 40 x 50 feet, on Water street, in Manchester, Mich. He has the Ford agency.

The Pioneer Automobile Co., of Oakland, Cal., has established a branch in Sacramento; it is located at 10th and L streets.

J. F. Wallace has secured a permit to build a one-story brick garage at 6049-51 South State street, Chicago; it will cost $71,000.

J. Karlson has opened up in New Brighton, Staten Island, N. Y., under the style Brighton Heights Garage; E. Johnson is manager.

P. J. Smith and his son, Victor, of Lemoore, Cal., are about to open a garage and machine shop; accessories also will be stocked.

The Twenty-second Street Garage in Toledo, O., has been purchased by Frederick Seyfang; the style has been changed to Star Garage.

Motor Car & Supply Co. is the style adopted by a newly organized business in Savannah, Ga. It is located on East Broughton street.

Permission has been granted W. C. Adams, of Jamaica Plains, Mass., for the erection of a garage on Lochstead avenue; it will be a brick structure.

F. J. Finger and H. L. Mann have entered the selling field in Portland, Ore. They have the Stutz agency and are located at 59 North 23rd street.

Baker Bros Motor Car Co., of 1227-29 Main street, Buffalo, N. Y., has changed its name to Cole Motor Co. It is western New York distributer of Cole cars.

Arthur Thompson, a half owner of the Augusta (Ga.) Automobile Co., has sold out to J. K. Winters; the new owner will take an active part in the business.

Permission has been granted to J. A. Johnson, of Chicago, to build a one-story garage at 5546-48 Wentworth avenue; it will represent an expenditure of $8,500.

J. A. and Cline Bagwell, of Macon, Ga., have entered into business in Savannah in the Broughton & Lamb Garage at 213 Broughton street; they are Little agents.

James E. Morse, of Harvard Lawn, Mass., has secured permission to build a garage on Prentiss street, Watertown, in the same state; it will accommodate 50 cars.

John W. Hubbard, of Port Chester, N. Y., has sold his interest in the City Garage to Clifford Flint; Flint and the other owner, Arthur B. Lowden, will carry on the business.

The Davenport (Ia.) Auto Co. has been sold by Steinhauer & Frey to A. Leberman and G. V. Davis; the purchasers will handle the Apperson and will operate a taxicab service.

W. C. Stopher, of Sterling, Kan., has opened a garage and salesrooms at 149 North Market street, Wichita, in the same State; he has the Regal and Abbott-Detroit agencies.

Roberts & Hodavi and John Frahm, of Maquoketa, Ia., have sold the Roberts Auto Garage to Stephen A. Palmer; the new style will be Palmer Auto Garage & Supply Co.

New Point Garage is the style chosen by Charles Moeller & Son for a business they have opened up in Elizabeth, N. J. The location is at New Point road and East Jersey street.

Dodge & Son, garage and machine shop operators in Boone, Ia., have sold their interests to C. E. Rogers, formerly of the Quinn Wire and Iron Works; the Dodges, D. C., Jr. and Sr., will leave Boone.

H. J. Clark and J. H. Runcie, the latter a paper box manufacturer, have formed the Kansas City Cole Motor Co. and will handle Cole cars in that city; Clark formerly was employed by the Kansas City distributers of Coles.

The Western Auto Sales & Manufacturing Co. has been formed in Omaha, Neb., to deal in used cars; the officers are: President, A. W. Gillman; vice-president, A. W. Cole; secretary, M. M. Searles. The capitalization is $50,000.

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Under the style Ohio Motor Co., E. J. Ansted and W. M. Shields have entered the trade in Toledo, O. The firm has the agency for Randolph trucks and the Commerce delivery car; headquarters are in the Meredith building.

Charles D. Brown, of Rochester, Minn., has sold a part interest in his livery business to Anton Hasley and the firm now is known as Brown & Hasley; Brown formerly confined his operations to a horse livery, but a garage and automobile livery are being added.

The R & L Co., eastern distributers of Garford cars and trucks, have opened a Boston branch at 915-21 Boylston street in a four-story building; P. C. Chrysler, who has been connected with the trade for several years, principally in New York City, is manager.

With liabilities of $16,195.32 and assets of $5,355.34, the Commercial Maintenance Motor Co., which operated a garage in Newark, N. J., has been placed in the hands of a receiver; the company was organized in July, 1910, with an authorized capital of $100,000 and $10,000 worth of stock.

F. E. Richardson has withdrawn from the Richardson-Neighbors Motor Co., of Cleveland, O., Cole and Hupmobile distributers, and has organized the Richardson Motor Car Co. He takes with him the Cole agency and will locate next door to the concern from which he withdrew.

The Atlanta (Ga.) branch of Charles E. Miller, of New York City, will be moved October 1st or as soon thereafter as is possible from its present location at 66 Edgewood avenue to a new structure at 259 Peachtree street. This latter thoroughfare is now the "automobile row" of the Georgia metropolis.

The Illinois Automobile Co. has been formed in Chicago and has headquarters at 1240 Michigan avenue, where it will handle Briggs-Detroiter and Fal cars and Krebs trucks. The officers, who are well known in the "automobile row," are: President, W. G. Benner; vice-president, R. B. Holt; secretary and treasurer, E. H. Marhoefer; sales manager, D. E. Northam.

To secure more extensive quarters for the Overland business in New York City and vicinity, C. T. Silver, the metropolitan distributer, will move October 1st from his present location at 1599 Broadway to the Lozier building at 1751 Broadway; this is a five-story structure. Simultaneously the Lozier Motor Co. will move into the Stoddard-Dayton building at 227 West 57th street, an eight-story structure.

Andersch Bros., fur merchants in Minneapolis, Minn., have entered the automobile field; they have secured the Abbott-Detroit agency for Minnesota and North and South Dakota, and will erect a building in Minneapolis for their new business. The firm style will be Andersch Brothers Motor Co. George B. Levy, who has been associated with the Anderschs for years, will manage the agency.

AMERICAN "INVASION" DISCUSSED AT RITZ "TEA"

London Editor Embraces Letts's Idea of Yankee Cars With British Nameplates—Syndicate Talked Of.

W. M. Letts plus the Daily Express, one of London's "penny dreadfuls," has succeeded for the moment in diverting the attention of at least a portion of the British public from the German bugaboo to the American "invasion," the latter, unlike the German article, a peaceful "invasion." Letts, like some others, had "viewed with alarm" the increasing sale of American cars in the "tight little isle" and the view had given him more or less pain, despite the fact that for several years he himself has sold American cars in conjunction with British and Continental productions.

When the Daily Express also saw the spectre which was darkening its shores it likewise took alarm, and when Letts outlined an Utopian scheme for beating back the "invader," and using its own weapons in doing so, the editor of the Express, by name Ralph D. Blumenfeld, threw his arms around Letts and he called a meeting which, according to cablegrams, occurred on Tuesday last, 17th inst., in the Ritz-Carlton, in London, at which tea was served and at which they discussed how best to shoot the American motor car full of holes, or petrol, or something.

Apparently, Letts's plan formed the chief topic of discussion. Letts, who has visited America several times and who is fairly well known to the trade of this country, has an idea that if a certain number of British automobile manufacturers will join hands and establish a more or less co-operative factory for the production of low-priced cars the American article will shrivel instanter. Letts fancies that each member of this co-operative syndicate can sell two or three thousand small cars each year through their respective agents, and at the same time live in peace and harmony and share handsome profits. As he estimates that it will take nearly two years to "really get going at full speed," Letts, who believes in quick action, would have the proposed syndicate immediately purchase parts in America and until its own factory is in position to turn out all-British cars he would have it assemble American cars with British workmanship and put a British name plate on them. It's as simple as A B C and very much easier than rolling off a log!

The first that was heard of Letts's scheme was several months ago when an English visitor to Detroit made known that something of the sort was in the wind. At that time it was spoken of as practically a certainty; the visitor was even supposed to be purchasing the necessary parts, but from the cabled reports Editor Blumenfeld's tea party at the Ritz on Tuesday did little, if anything, to bring the day nearer. Those present at the party were as follows: Lord Montagu, Sir Charles Friswell, Charles Jarrott, Frank Shorland, Sidney Thornycroft, Sidney Straker, Frank Lancaster, and, of course, Letts and S. F. Edge, who writes more "letters to the editor" than any other man in the world, and who is his own best press agent. All of the guests are intimately identified with British automobile interests.

While the editor of the Daily Express and some others appear to have aroused themselves to their finger tips, the British automobile trade press does not share their hysteria. Instead, some of the trade papers are inclined to poke holes in the Letts proposal, pointing out, among other things, that if it is true, as he publicly stated, that only three of the American manufacturers who are represented in England are making money—and that one of them is about to cry "enough"—the "invasion" cannot be as dreadful as has been pictured.

Manufacturers to Try Mutual Insurance.

Because of the high accident insurance rates which grew out of the passage of a drastic employers' liability and workmen's compensation act passed by the last Michigan legislature, 13 of Detroit's most prominent manufacturers, nearly all of them identified with the automobile industry, practically have decided to pool interests and carry their own insurance. For that purpose, they have organized the Michigan Workmen's Compensation Mutual Insurance Co. and have incorporated under the laws of the state.

The officers are: President, Charles H. Gifford, treasurer of the American Blower Co.; vice-president, Roy D. Chapin, president of the Hudson Motor Car Co.; secretary and general manager, Elmer H. Dorth; treasurer, Hamilton Dey, secretary of the Detroit Clearing House Association.

But 11 of 15 directors provided for have been selected; the remainder will be drawn from the other companies which are expected to join the insurance corporation.

The 11 directors named are: President Gifford and Vice-president Chapin of the officers, and F. E. Ranney, president of the Ranney Refrigerator Co.; C. Haines Wilson, of the Wilson Body Co.; J. D. Dort, of the Durant-Dort Co.; H. Jay Hayes, of the Hayes Mfg. Co.; A. R. Demory, vice-president of the Timken-Detroit Axle Co.; Wilson Critzer, of the Anderson Electric Car Co.; A. H. Zimmerman, president of the Continental Motor Mfg. Co.; E. E. Hartwick, of the Hartwick Lumber Co.; W. S. Farrand, president and treasurer of the Farrand company.

Elmer H. Dorth, secretary and manager, was formerly insurance commissioner of Minnesota, and is thoroughly posted.

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THE MOTOR WORLD

PUBLISHED EVERY THURSDAY BY

ıe Motor World Publishing Company
0 BROADWAY NEW YORK, N. Y.

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scription, Per Annum (Postage Paid) $2.00
le Copies (Postage Paid) . . . . . 10 Cents
eign and Canadian Subscriptions $3.00
Invariably in Advance.

Postage Stamps will be accepted in payment for subscriptions. Checks, Drafts Money Orders should be made payable to The Motor World Publishing Co.

Change of advertisements is not guaranteed unless copy therefor is in hand SATURDAY preceding the date of publication.

Contributions concerning any subject of automobile interest are invited and, ceptable, will be paid for; or, if unavailable, will be returned provided they accompanied by return postage.

Cable Address, "MOTORWORLD," NEW YORK

ered as second-class matter at the New York Post Office, November, 1900.

NEW YORK, SEPTEMBER 19, 1912

TO RELIEVE THE USED CAR SITUATION.

Ever since the automobile industry amounted to more than the overbial row of pins the used car has constituted a problem. ıe size and seriousness of the problem have increased as the ıde itself has expanded and it has affected no one so greatly as e dealer. It has been the hole through which uncounted thou-nds have slipped. In many instances it has meant the difference tween profit and loss when it has not meant the difference be-een success and absolute failure.

The problem remains as large and as serious as ever it was, and ıth the present trend toward six-cylinder cars and, because of it, e prospect that the already large number of used "fours" on the arket will be enormously increased within the next year or two not a comforting one and should not be permitted to remain ıconsidered.

The subject has been discussed many times and oft but the ılution is no nearer. It may be that solution is impossible, but any rate in this broad country there must be men with ideas on ıe subject that have remained unexpressed and who have handled ıe used car in a manner that has worked for more than ordinary lvantage.

If solution of the problem is impossible, it is very likely that, rought into the light, such ideas and practices as may prevail will t least point the way toward a measure of relief which is very ıuch desired and which cannot but work for the common good.

The Motor World desires such ideas. It believes that they may prove of such benefit to the whole industry, and to the dealer particularly, that they are worth searching out.

To that end, the Motor World will pay $50 for the best article dealing with the subject of used cars; it will pay $25 for the next best and $15 and $10, respectively, for the two others which are deemed most worthy.

The articles may be long or short and "literary style" will not figure in the award. Practical ideas, and preferably plans which have been put into practice and proved true, are what are desired. The policy pursued by the small dealer is likely to prove quite as valuable as that brought to bear by the large one.

As the subject is one that directly affects the health of the whole trade, it is not a time for anyone in the industry to hold his peace. Speak up! The Motor World offer is open to all.

DO DEALERS DESPISE THE DIMES?

If what has come to be known as the "gasolene situation" serves to point to more than a particular moral, that moral lies in the general failure of automobile dealers to make the most of an uncommon opportunity and to indicate that, generally speaking, they are deficient in that enterprise which makes for truly modern merchandising.

To be specific: The high price of gasolene has keenly sharpened interest in all of those devices which make for fuel economy, of which there are not a few available, many of them articles of real merit. There can be no doubt that properly displayed, or advertised, or otherwise exploited locally, tens of thousands of them easily could have been disposed of during the past several months. The automobile owner has been in a receptive mood for that sort of thing and it required small effort to turn his interest to commercial advantage.

If any dealer has risen to the occasion and made the most of the opportunity, let him speak up; for surely he deserves to be singled out from his fellows. And when we say "made the most of the opportunity" we mean not merely selling fuel economizers when they have been called for—but making a striking or otherwise unusual display of such articles, publishing an advertisement dealing with them or mailing to automobile owners in a particular community letters which point a way by which their fuel expense could be reduced.

The situation is such that the dealer who conducted what the department stores term a "sale" of such articles scarcely could fail to have reaped a harvest, both in prestige and in pocket.

The failure of the dealer to take advantage of the opportunity offered in this instance is in line with his neglect of accessories generally. Usually he sells them only when they are asked for, which calls for neither effort nor acumen on his part. Whether such neglect is due to the perhaps natural weakness which shows itself in reaching out for the dollars which are represented by the sale of cars and permitting the dimes to take care of themselves, or to go elsewhere, is an open question which probably merits an affirmative answer.

However that may be, the most successful merchandisers in other lines of industry do not despise the dimes, and unless the automobile dealer arouses himself to their importance and makes the most of accessories, that very desirable and enduring trade will be lost to him forever, and, as the Motor World pointed out last week, probably will be controlled by department stores and hardware dealers, who already have laid hands on it.

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PLANNING PROGRAM FOR SALESMANSHIP MEETING

Indianapolis Projectors Secure Support of Elbert Hubbard and Others—Unusual Entertainment Also Mapped Out.

Plans growing out of the suggestion made by J. J. Cole, president of the Cole Motor Car Co., for what now is styled the National Salesmanship and Advertising Convention have taken such shape and assumed such importance that there is little doubt that the convention, which will be held in Indianapolis on Tuesday and Wednesday, October 8th and 9th, will prove in the nature of an occasion.

The active work of preparing the program and arranging the details is in the hands of a committee composed of Homer McKee, the Cole advertising manager; Paul Ritchie, representing Nordyke & Marmon; D. B. Williams, advertising manager of the American Motor Co., and Guy Simon, vice-president of the Motor Car Mfg. Co. They are holding meetings each evening with representatives of other local automobile companies, and already have sketched a tentative program which provides for not merely the exploitation of subjects which have to do with salesmanship and advertising, but which will lighten the serious side of the gathering.

Among the entertainments in view are a balloon ascension with the passengers seated in an automobile instead of a basket, demonstrations of skillful driving by experts from Indianapolis factories, a "Speedway" dinner, which will be served in "laps," and an "automobile masquerade," which will take the form of a parade, in which the cars will be disguised with floral decorations.

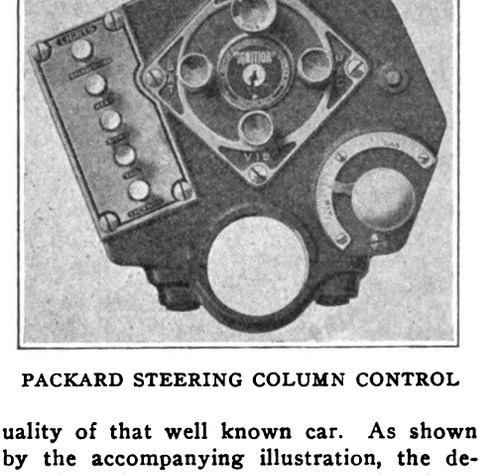
Charles A. Bookwalter, former mayor of Indianapolis, will deliver an address of welcome to those in attendance at the convention, which will be presided over by W. D. Nesbitt, of Chicago, as permanent chairman. Among the prominent men who will make addresses on salesmanship will be Elbert Hubbard, of East Aurora, N. Y.; President Sheldon, of the Sheldon School of Salesmanship; John Lee Mahin, of the Mahin Advertising Company; E. Leroy Pellitier, director of Flanders advertising; Martin V. Kelley, of the Fuller Advertising Agency; General Manager Deeds, of the National Cash Register Co., and General Manager Laskar, of Lord & Thomas.

Lehigh Adopts Automobile "Handcar."

By way of conserving the energy of its employes, the Lehigh Valley Railroad is replacing the time-honored and familiar handcar with modern motor propelled vehicles. Already some 47 automobile "handcars" have been placed in service, and it is planned eventually to oust the old-fashioned means of transporting section gangs and tools completely. The new vehicle provides accommodation for seven men and a quantity of tools, and is capable of speeds up to 20 miles an hour. It is light enough to be lifted quite easily.

Little Known Features of Well Known Cars

Exemplifying the growing tendency toward the production of a clean dash and at the same time placing the more vital of the control elements in a position where they are even more readily accessible than when the dash location was adhered to, the 1913 Packard is characterized by a control board which further adds to the individuality of that well known car. As shown by the accompanying illustration, the device is designed for attachment directly to the steering column by means of the split screw-clamp, and, when so attached, the board is mounted with sufficient clearance between it and the steering wheel to permit free movement of the hand of the operator, and where it always is within easy reach and plain sight. On the control board are mounted the usual ignition switch of the lock type, the switches being operated by means of buttons, an auxiliary air adjustment for the carburetter, the push switches for the control of the electric lights, and a push button for use in connection with an electric signal, each being plainly marked. The board itself is a cored bronze casting carefully finished to match the trimmings of the car. The switch plates are attached by means of screws, and the wires and rods are carried below the floor boards in a brass tubing which attaches to the steering column.



PACKARD STEERING COLUMN CONTROL

Prest-O-Lite Registered in England.

Prest-O-Lite, Ltd., has been registered under British laws with $500 capital. Its principal office is given as 150 Victoria street, Westminster, London.



September 14-21, Chicago, Ill.—Chicago Automobile Trade Association's fall opening.

September 16-21, Detroit, Mich.—Automobile show in the Automobile Building at the State Fair grounds under the auspices of the Michigan State Fair Association.

September 17, Milwaukee, Wis.—Grand Prize road race under the auspices of the Milwaukee Automobile Dealers' Association.

September 21, Providence, R. I.—Track races under the auspices of E. W. Powell.

September 21, Pittsburgh, Pa.—Track races promoted by E. A. Moross.

September 21, Milwaukee, Wis.—Vanderbilt Cup race on the Wauwatosa course under the auspices of the Milwaukee Automobile Dealers' Association.

September 21, Detroit, Mich.—Track races under the auspices of the Michigan State Agricultural Society.

September 23, Milwaukee, Wis.—Grand Prize road race under the auspices of the Milwaukee Automobile Dealers' Association.

September 28, Indianapolis, Ind.—Track races under the auspices of E. A. Moross.

October 4-5, Sioux City, Ia.—Track races under the auspices of the Sioux City Automobile Club.

October 7, Detroit, Mich.—Start of the National Reliability tour to New Orleans for the Glidden, Anderson and National trophies.

October 7-11, Chicago, Ill.—Chicago Motor Club's reliability run.

October 7-12, St. Louis, Mo.—Outdoor show in Forest Highlands Park under the auspices of the St. Louis Automobile Manufacturers and Dealers' Association.

November 8-16, London, England—Society of Motor Manufacturers' and Traders' annual show in Olympia Hall.

January 11-18, New York, N. Y.—Automobile Board of Trade's 13th annual show in Madison Square Garden and Grand Central Palace. Pleasure cars only.

January 20-25, New York, N. Y.—Automobile Board of Trade's 13th annual show in Madison Square Garden and Grand Central Palace. Commercial vehicles only.

February 1-8, Chicago, Ill.—National Association of Automobile Manufacturers' 12th annual show in the Coliseum and 7th Regiment Armory. Pleasure cars only.

February 10-15, Chicago, Ill.—National Association of Automobile Manufacturers' 12th annual show in the Coliseum and 7th Regiment Armory. Commercial vehicles only.

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GARAGEMAN WHO INSISTS HE'S IN BUSINESS "FOR LOVE"

Proprietor of One of New York City's Largest Garages Elaborates on Previously Expressed Public Statement—Declares He Makes a Living But No Interest on Investment—Claims Gasolene and Other Profits Equalize Storage Losses and Gives Figures.

When a man arises during an open meeting of his fellow tradesmen and declares that he has been doing business "for love" for some three years, and that he is still pursuing the same profitless existence on the "love" basis, he at once becomes an interesting personage; although many who attended the recent dinner of the garagemen of New York City and who heard this statement made by Maurice Segall, president of the Apthorp Garage Co., grinned or were inclined to doubt the sincerity of Segall's statement, for the Motor World's benefit, he since has produced figures to prove his assertion. His startling arithmetrical demonstration resolves itself into the reason why, with an investment of no mean proportions, he is realizing not one cent on it.

Segall's establishment is one of the largest and best kept in New York City, and is housed in a five-story concrete building at 14-16 West 80th street. His brother, J. Segall, is treasurer of the concern, and another brother, David, is employed by the company. All three brothers draw salaries; in fact, and lest it be hastily surmised that the profits may be returning to the Segalls in the way of salaries, Segall stated the amounts received by each, and considering the volume of business and the responsibility entailed, it is fair to add the salaries of the Segalls are far from exorbitant; in fact, some men would hestitate to accept their positions at the prices.

Leaks Stopped, Yet No Profits.

"When the salaries and other expenses are paid," said Segall, "we have absolutely nothing as an interest on our investment; in fact, in the summer months we frequently run behind."

And all this results in a garage which appears to be managed in a thoroughly modern manner, under methods which show where every cent goes and the source from which every cent is derived. The system of management apparently has stopped up the "leaks" which are the ruination of so many garage businesses, and Segall declares emphatically that what is needed is rejuvenation of the business itself; the placing of it on the sound basis it has not heretofore known, and the establishment of a scale of prices which will permit a living profit. Segall is making a living—his salary guarantees him that—but for the accumulation of previous years, the money he has gotten together and put into the business, he has nothing—it is as if he were working for another man for a wage and got no further benefit from the establishment.

"Why is it this way?" said Segall. "A great many people do not know. But I know; we are not making a profit on our storage and other sources of income that is at all commensurate with what we have to put into it."

Segall and others who are familiar with the garage trade know that the great trouble with too many garagemen is that they have little system and do not know whether they are making money or losing it. If they come out behind they naturally conclude they have lost it. But where it may have gone they do not know. If they win, they also are in ignorance of the reason. All cry about the high price of gasolene—and this is one reason for Segall's losing game—but when asked for a concrete illustration of the manner in which the raise has affected them, they are at a loss for an answer.

WHY ONE GARAGE DOES NOT PAY.

Receipts—		
Storage	$35.00	
Profits on gasolene, supplies, repairs, etc.	11.00	
Total receipts		$46.00
Expenses—		
Storage	$14.50	
Cleaning	21.00	
Inspection	2.70	
Material	1.50	
Light, heat, etc	1.75	
Telephone calls	4.50	
Total cost		$45.95
Profits		Negligible

"My brother and I took over this business about three years ago," said Segall, "and today I consider that we have one of the best and most desirable garages in the city of New York. We have tried hard to make it make money; it ought to show a profit of several thousand dollars a year—but it doesn't. We have here a capacity for one hundred cars, and most of the time we are practically full. We charge a flat $35 rate of storage for open cars, runabouts and touring cars alike, while for closed cars our price is $40. We make no difference in price because a car is small, for it takes up just about as much room as a big car, and it takes almost as much time to take care of it.

How Storage Charges Work Out.

"Just to show you where we are losing, let me give a few figures that I know are right, because we have an accountant up here every two months to go over our books, and we can put our finger on every penny any minute. Here we are getting $35 a month for a touring car; that figure we will place on one side of the sheet. Now on the other side let us set down a few items showing what it costs to prepare this service that the owner of the car buys for $35. The storage of the car alone we have ascertained from real figures is $14.50 a month for each car; there is a big slice of the $35 gone at one clip. Then there comes the washing and cleaning; this costs us 70 cents a car, and it has to be done every night, that is, provided the car goes out every day, and there are very few which do not. Assuming that there are thirty days in a month, which figure will allow for a few of the days the car does not go out, the monthly cost for cleaning and washing is $21—add this to the cost of storage and we are fifty cents in the hole already.

"You say we can make it up elsewhere! But can we? Look here! After the car has been cleaned by the night man a day man has to look it over. This takes on an average of, say, twenty minutes, for if he finds something not just right, he often has to spend an hour on the car. This is an item that an unsystematic business man likely would overlook, but it counts up. The man works by the week and probably averages 20 cents an hour; this adds about nine cents a day to the cost of keeping the car, and the 30 days total is $2.70. Two dollars and seventy cents isn't much, but on one hundred cars it is $270. That brings the storage cost up to $38.20.

Material Used and Telephone Calls.

"Now, wait a minute! Here's more! The day man in monkeying around the car getting it in first class condition uses up an average of five cents worth of material, and on the monthly total this adds $1.50, making the cost of storage to us $39.70. So far we have lost $4.70 a car and on 100 cars it is $470. I wish that loss was my salary. Oh, there's more yet; don't stop figuring! We have considerable overhead that cannot be dispensed with, and for light, heat and elevator power the cost per car

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per month is something like $1.75, which brings us up to $41.45. Six dollars and forty-five cents in the hole.

"You might not think of this, but put in the telephone calls. The people who store with us require telephone service, and the calls are all charged up to us. Every car gets about three calls a day. At five cents a call this is $4.50 a month and the figure has climbed to $45.95, just a nickel under $46. There are other items that make the cost still more, but those are the main ones and it seems to me to show why there is no profit in storing a touring car at $35.

Part Played by Gasolene's Price.

"If there were no other profit in the business outside of the storage we wouldn't have any business. We couldn't run a week. Now to get to the gasolene question: We are buying it now for 16 cents a gallon. We used to sell around 20 and 22 cents to our customers, and when the price was down around nine cents we used to make profit enough on gasolene to keep things going, but the general profit never was very big. Then when gasolene started to climb and got to 16 cents, we were in trouble. I finally decided we had to do something, and I marked my gasolene up to 25 cents a gallon. I had to do it. If an owner of a car buys gasolene of me I am able to get back from him on gasolene some of the money I am losing on storing his car. I have explained this matter to the chauffeurs who run the cars, and have requested that so far as possible the owner get his gas here, even if it costs him a cent or two more than he could buy it for elsewhere. It may seem an illogical thing to do, but I cannot afford to store a car unless the owner will buy his gasolene here. In fact, I have had to tell several owners who were buying their gas outside at lower prices that I could not store their cars, and they have left; but I would rather not have their trade than have it and lose money on it.

"Of course, we handle some supplies. In fact, we have about everything an owner could ask for, but they do not always buy here. We make some profit on these, but it is not large. I do it as much to accommodate the customers as for anything else. If a man needs a tire or a part on Saturday afternoon or Sunday, he can get it here if he is at the garage, or, if he is out on the road, he knows that all he has to do is to telephone the garage and we will send it to him.

Solution Rests in Radical Changes.

"What is my idea of the solution of the problem? Well, there would have to be a mighty big change to make this business pay the way it ought to. One thing I would like to do, would be to put everything on a proper basis, or somewhere near it. The profit on gasolene is so large now, or has to be so large, that the owner does not like it, and that is one fault upon which the trade has grown up; the garagemen have tried to make attractive storage rates and make up for the loss on their gasolene profits. I would rather sell gasolene at a two-cent profit. At present the gasolene and accessories profits and the repair shop work just about even up the loss on storage, but if storage were raised ten dollars, making the rates $45 and $50 instead of $35 and $40, and gasolene were cut down to 18 cents, giving us a profit of two cents a gallon, we would have things on a more reasonable basis. I have figured it out and I find that even then we would not be much better off than we are now. As near as I can figure our receipts per car would be about one dollar more, and that doesn't begin to bring it up to a point where the investment would pay.

"For the amount we have stuck in here we would have to charge a storage rate of $55 or $60 to get what we should. Some day we may be able to do it, but we can't yet. I will say this, however, that the garage business has got to be pulled up onto a more businesslike basis or it will see its finish. Take a look around and see how often the garages change hands. Do you suppose for a minute that if a garage was paying good money the owners would be continually selling out? No! They stay in until they are glad to get out in any shape. I am not advertising my business for sale, but if a man came along tomorrow and offered me anything like what I put in he'd get the business so quick he wouldn't know what happened.

First Class Service Expensive.

"There are a great many ways in which I could cut down on service expenses, but I won't do it. By making the flat rate for all sizes of cars I have got only big cars now, and they are as fine a collection of cars as you can find. I used to be in the picture business, and although I have been out of it for some time, I still retain a love for art, and that prompts me to keep things looking eye-pleasing. Every car in here is cleaned up the best the men know how every day, and the place has a reputation for turning out good work. We could slight the cars and maybe get along with less help, but as long as I run the garage it is going to be run right; when I can't do that I'll quit. We plan to give the car owner the best possible service, but I would like to see the business making a little money on the side."

Evidence of Modern Methods.

All the time Segall was talking of his business he was pointing with pride to the various features of his establishment and referring with satisfaction to the systems and devices which had been installed for the benefit of company and customer. Floors, of solid concrete, were neat and clean. On every floor was the portable tank in which the floor men are given their gasolene, and each floor man is required to account for every gallon; there is no leakage there. Other checks on supplies are used, and while the most infallible of systems sometimes goes wrong. Segall seemed justified in his belief that he had the "leaks" well stopped up. And the appearance of the cars in view bore out his statement that they are well kept.

He was asked if he ever expected to see the day when his garage would pay the profit it should pay. He said he did not, but that he hoped some kind of an adjustment could be made whereby it would be more than a mere case of even break. Segall himself admitted that he would have been better off today had he put his money in a bank three years ago and dug up a job for himself.

Chicago Dealers Have "Fall Opening."

Chicago dealers believe in burning red fire and beating tom-toms as a mode of stimulating sales, in the fall, at any rate. They inaugurated the practice last year when they held a "fall opening," during which new models were on display in the salesrooms of the respective dealers, and when interest was fired by several street parades, instructive in character, which passed through the principal thoroughfares, and they are continuing the practice this year on an even more elaborate scale, this having been raised by levying a "tax" on a frontage basis on the stores facing the streets which have been decorated for the occasion. The chief decorations are very numerous white pillars bearing streamers and of varicolored electric lights which contribute the festival appearance aimed at.

On the opening night, Saturday, 14th inst., the celebration took the form of a mammoth motor truck parade, embracing 367 commercial vehicles, of all sizes and fitted for widely varying labors. Naturally the affair was enlivened by music from several bands, which were distributed through the ranks, and by the attractive appearance of several of the trucks which were artistically decorated and illuminated with electric lights.

Monday, known as Fire Prevention Day, witnessed a display of all the fire-fighting apparatus, both municipally and privately owned, that could be mustered, manned by men from the fire department and retired veterans. The machines paraded in chronological order, showing the evolution of fire engines and hose carts from the obsolete manually operated machines to the modern motor driven and motor operated vehicles.

Electric pleasure cars had their "innings" on Tuesday, and as was the case with the parade of fire-fighting apparatus, the older cars were featured as well as the superbly finished 1913 models. Wednesday evening was given over to the display of gasoline pleasure cars of vintage prior to the year 1904.

The three evenings which remain before the festivities are brought to a close on Saturday evening, 21st inst., will be devoted to a parade embracing the products of the accessory manufacturers.

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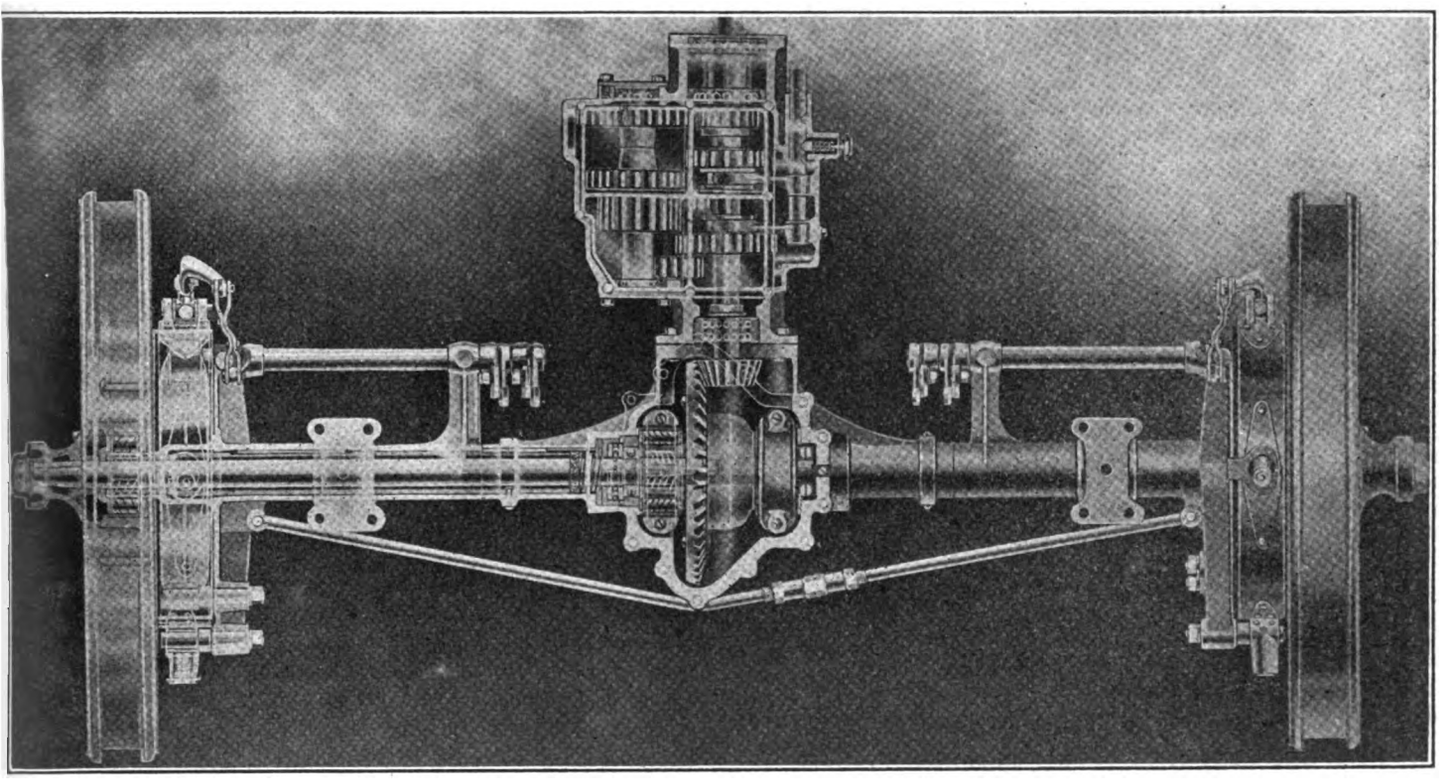
VERLAND REAR AXLE ALMOST FLOATING

nstruction That Keeps Weight Off Driving Shafts and Permits Advantageous Placing of Ball Bearings.

Through long continued use, the semi-ıting and the full-floating axles have be-ne familiar. There are few who do not lerstand their construction and their ad-ıtages. But the three-quarter-floating wheels are attached to the axle shafts instead of to the axle housing. The three-quarter-floating axle thus is similar to the semi-floating type. There is an important difference, however, in that in the former the driving shafts do not support any of the weight of the vehicle. Similarly, in the full-floating axle, the driving shafts do not support any of the weight of the vehicle. In both the full-floating and the three-quarter-floating the axle shafts serve merely to rotate the road wheels, whereas in the semi-floating type the drive shafts and the axle housing support the weight of the vehicle equally, and in addition the drive shafts serve to rotate the road wheels.

Inasmuch as in the three-quarter-floating never require adjustment. To absorb the side thrust, adjustable ball bearings are located on either side of the differential. Not the least of the advantages which accrue under this system of construction is that it becomes a very simple matter to provide adequate means for retaining the lubricant. Occasionally oil leaks out in the ordinary type of semi-floating axle and works into the brakes, but in the Overland three-quarter-floating mechanism this trouble is obviated by heavy felt washers.

Barring the actual construction of the axle itself, other features not closely allied with the driving of the vehicle also are worthy of note. The brakes, for instance, upon which the safety of the occupants often depends, are new and are unusually liberal in size considering the size of the car. The brake drums measure 13½ inches in diameter and 2⅞ inches in width. Two methods of adjustment are provided, the one at the adjustment sector and the other on the brake rods. All parts have been constructed with a view to obtaining the maximum simplicity and accessibility; the differential pinions and bearings readily are adjustable without the necessity for dismantling the mechanism. The change gear mechanism is incorporated in a unit with the differential which construction insures absolute rigidity of the parts and the positive maintenance of the proper relationship between them. The propeller shaft is not open, as is fairly common, but is enclosed in a tight tube, which serves the additional purpose of absorbing the twisting strain imposed by tractive effort and braking.



PART SECTIONAL VIEW OF NEW OVERLAND THREE-QUARTER-FLOATING REAR AXLE SHOWING UNIT CONSTRUCTION

ır axle, on the other hand, is of comratively recent origin, and though its me serves to indicate both its construcn and its purpose, neither is as well own as is desirable in view of the grow-g tendency toward its adoption. Among e more prominent manufacturers who ve discarded the two earlier types of les in favor of the new one is the Willys-verland Co., of Toledo, O., the three-arter-floating type having been adopted r all the later series of Overland cars ar the model number 69. The importance the change may be judged by the opin-n of the Overland engineers themselves ıo cite it as "the greatest improvement ıich has been made on the 1913 Over-nd."

The new axle is shown by the accom-nying illustration, and its principal ıint of difference between the usual style full-floating axle is that the driving construction the driving shafts are left perfectly free of the weight of the vehicle, which is supported entirely by the axle housing, it is a comparatively simple matter to provide more than ordinarily adequate bearing surfaces. In the new Overland axle, the axle housing is reinforced by a steel tube which is riveted and keyed to the housing proper. This tube projects at each end of the housing, and it is on this that the wheel bearings which are of the roller type, are mounted. As a consequence, the differential bearings and the wheel bearings do not come in contact with the axle drive shafts. The shafts themselves are of special heat-treated chrome-nickel steel. Another important feature is that by reason of this construction the wheel bearings may be placed directly in the center plane of the wheels and thus receive a straight radial load. Wear, of course, is minimized, and the bearings

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WIDEAWAKE MERCHA

Clean, Attractive Salesroom an Absolute Necessity.

What would you think of a piano dealer who would invite you into a white-washed but dirty looking former livery stable to show you the instrument he had for sale, or who had just one style? Then suppose he led you to a dirty desk flanked by two dirty cuspidors and after some delay produced from some mysterious pigeonhole a long list of photographs from which you were to pick your piano, priced at several hundred dollars. What would you do? What would you say? Would you care to bring your wife to such a place?

The piano dealer in this case is not a piano dealer but a dealer in automobiles in Michigan's second city. It is regrettable to say it, but he is not the only automobile dealer so situated.

Even a man protests against such a salesroom. It pays to bear in mind that women are becoming an ever-increasing factor in the selection of cars. In many cases they have the absolute say. Is it any wonder that many sales are lost where the car is right and a demonstration has been perfectly satisfactory but where the other essentials for giving confidence and respect are lacking?

Cars Should Be Displayed in Attractive Surroundings.

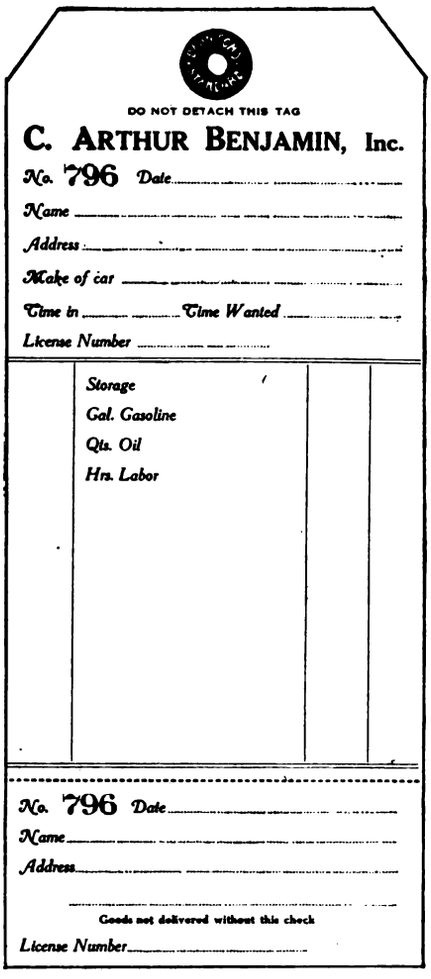
The first element in good retail merchandising is to provide a proper place to show the goods. This applies to automobiles just as much as to clothes, furniture or pianos. And you will usually notice that people prefer to trade at the most attractive store. The shrewd merchant invests thousands of dollars in creating inviting entrances and providing rest rooms and other magnets for his customers.

The possibilities of a good show window and a pleasant, attractive, clean, bright reception room are unlimited. No dealer can afford to overlook them—but too many of them do so.

There is no need to go to extremes. But there is room for marked improvement in this direction, especially in the smaller cities, and the dealer who awakes to this fact and provides an attractive, business-like place for the reception of his customers will find that he has armed himself with one more silent but nevertheless potent argument that will help pull the dollars his way.

A Red Tag That Prevents Mistakes.

Many a good customer has gone to a garage in the early morning fondly dreaming of the well cleaned, well polished car awaiting him, only to be met with the information that some way or other his car had been overlooked. Got all the rest, but missed his! Isn't it maddening?



TAG THAT PREVENTS OVERSIGHT
Printed on red cardboard signifies car is to be washed and polished; printed on white signifies "for storage only."

Nobody is disappointed at the garage of C. Arthur Benjamin, in Syracuse, N. Y. Below are shown the tags that prevent it. Notice the two tags are exactly alike except that the one on the right has instructions to wash and polish. This card is a bright red. The other card is white. The night man easily can pick the red ones.

Incidentally the same card covers many other possible instructions and the identification check at the bottom, without which no car is delivered, saves many explanations. A tag of the right color goes on every car that comes in for storage or repairs, and when repairs are made a special repair order is made out—in addition—but that is another story.

"Repairs Strictly Cash."

A repair bill presented some weeks or even several days after the job has been delivered looks big, and usually provokes a large sized kick—which makes it pertinent to remark that the best time to present the bill and collect the money is when the customer is crazy to get the car. Details then are fresh and readily explained. Experience has shown that most customers will meet the demand for cash for repairs with their check book and smile—especially when the work is satisfactory. Some dealers have found it profitable to post a sign reading "Repairs Strictly Cash." This does not drive work away and eliminates necessity for explanations.

Uniform action on the part of dealers and garage men everywhere often would mean the difference between a fair profit and a positive loss.

Service That Added Reputation and Profit.

Ask ten different car owners what constitutes service and you will get ten different replies. The Motor World will turn the light on many different kinds of service that live dealers are rendering customers. All of these contribute to better business and better business is but another way of saying better merchandising.

A few days ago a tourist drove into the garage of a "live wire" Syracuse (N. Y.) dealer. Among other things he had discovered that one of his casings could not be relied on much further. He replaced it with his extra, and this left him without a dependable reserve shoe. The size wanted was 42 x 5 inches. Few places stock that size. The dealer did not have it. Did he fold his arms and express regrets? Not for one minute. In half an hour he had discovered that no other Syracuse dealer had a 42 x 5 inch casing. He phoned to the Buffalo branch of a tire concern. There were none in Buffalo, so he phoned the tire maker at Akron, Ohio, with instructions to

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ZING DEPARTMENT

ip that day by express to the tourist O. D. at Rochester, where the tire was livered and paid for next day. He made e sale, the tire company credited him ith the profit. But——

The profit was not all. It paid for his ouble, to be sure. But think of the pow- ful friend he made, the impression of up- -date, live service carried away by the stomer. It meant one more booster for m all along the line.

An unusual demand is an opportunity. he test of it often makes or breaks a rep- ation. Looking at it that way the pro- essive, active dealer can find many ways emphasize the all-round completeness id variety of his services to his custom- s.

ains Time to Think, Plan and Execute.

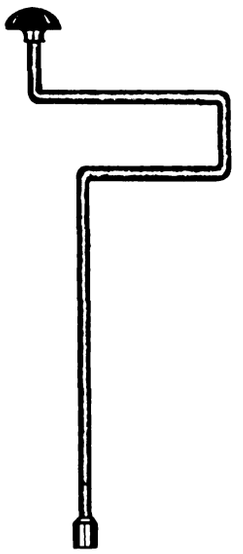
There is no question about the import- nce of details. But to be overburdened ith them is as likely to prove as disas- ous as to overlook them altogether.

It's a good thing to be in close personal ontact with customers, but the dealer who ducates his trade voluntarily or involun- rily to seek him personally for every- ing, even if they want only a nut tight- ned or a bolt put in or a carburetter ad- sted, is building a stone pile that is liable fall and crush him beneath its weight.

One dealer has rid himself of all petty etails by taking each customer out to the hop foreman and introducing him. The hop rule is that no workman can be called ff a job and no work done except by the oreman's orders or, in his absence, by omeone delegated for the job. This puts he control of the labor squarely up to the oreman. Customers quickly get the habit f going direct to the foreman for every- hing but the larger matters. In this way he foreman is doing no more work than efore, and the proprietor devotes his en- ire time to sales, demonstrations and ex- cutive work. He has more time for think- ng and planning and is doing the best usiness in town.

Simple Device Saves Time, Labor and Money.

In the Ford service station and assem- bling plant in Long Island City, N. Y., there are several simple but ingenious tools that save time and labor and, therefore, money, but one of which the superintendent is rather proud is the extension socket wrench which is shown by the accompany- ing sketch and which is about two feet in length. With this aid a mechanic can mount a partly assembled chassis and "wind up" the various nuts which hold the parts in place. Without it much time was lost, for the tightening of nuts required that the



ordinary spanners be shifted many times before the nut finally was drawn tight. With the new device, however, a single mechanic can do the work which previously required two or three men, and, what is more to the point, he can do it with very much better results, because he is able to work to better advantage in a nearly upright position than would be possible in the half-stooping, and groping, position which usually is necessary.

Novel Window Display That Sold Two Cars.

A Toronto dealer did not have a car left on his floor. Did he leave the display win- dow empty and permit the store to look as if the concern had just moved out, like so many dealers are doing while waiting for new models? Not much; he took the man- ufacturer's literature and by means of pins and stickers made an extremely attractive border for his window. He then moved a large table to the window center, covered the table with a dark green cloth and on it displayed the polished samples of parts he had on hand. These included pistons, cam- shaft, crankshaft, connecting rods, bearings, and many other things that almost every dealer has somewhere in the back part of his store, often dust covered. Each part had a little card, suitably inscribed, leaning against or lying on top.

The crowd that gathered proved an eye- opener to the Toronto dealer, and the sale of two cars that could be directly traced to interest created through the window dis- play showed that the idea was a profit maker.

"To tell the truth," said the dealer, "I had thought of doing it before, but I had be- come so accustomed to seeing the parts that I lost interest in them. I forgot that the great public outside had not seen them. I overlooked the fact that what was a chestnut to me was new to them. But I have learned a lesson, and, believe me, I will not soon forget it. I have resolved that hereafter everything that comes into my store in the shape of attractive litera- ture, signs, parts, etc., will find its way into my show window. As I look back over the past year and recall how many times my window was empty and how many times I had the same car displayed week after week, I realize how many profitable opportunities we have missed."

Readers of this page undoubtedly will recall similar occurences. But few will be able to forget an instance of a live hard- ware, grocery or clothing merchant miss- ing any such good bets. Most merchants regard their display space as one of their most valuable assets. And isn't an automo- bile dealer a merchant?

Window displays should be changed of- ten. The more different ways you have of making your window space attractive, the more you will "cash in" on the effort. Many manufacturers will gladly sell or loan such a display.

Truck Dealer's Move for Better Service.

Realizing the value of service as a sales argument and as the foundation for a growing business, the Foraker Dayton Mo- tor Truck Co., Chicago distributer of Day- ton trucks, has supplemented the regular truck guarantee of one year by offering to garage a truck the first year of service without charge. The company believes this will work well for owner and dealer, since, with the truck at all times under the deal- er's eye, it will give better service

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ENGINEER DECLARES OIL COMPANIES CAN LOWER THE PRICE OF GASOLENE

(Continued from page 6.)

Informed that hydrometer tests of gasolene purchased by the Motor World at three separate garages in New York and vicinity disclosed 70 per cent. gravity, or better, Mack's ears pricked up and he immediately showed renewed interest. The fact surprised him quite as much as it surprised the Motor World man, whose investigations sought to confirm widespread reports of the deterioration of the gasolene which now is being dispensed. As an extra price is charged for 70 degrees or 72 degrees gasolene, and it rarely is supplied except on special order, the informal investigation tended to increase the mystery of the situation.

"It must have been pressed gasolene," exclaimed Mack, when he learned of the occurrence, "but I did not know that it was being served to garages."

Danger of "Pressed Distillate."

Pressed gasolene is a vapor of petroleum or natural gas which is caught and compressed until it becomes practically a liquid gas. It is nothing more or less than gas under pressure, said Mack in amplifying his explanation, and on account of its high explosive qualities is dangerous stuff. Unless labeled, he believes its sale for use in combustion motors should be prohibited by law. It is commonly called "pressed distillate," or "case head naptha," and though often mixed with other low gravity naptha or gasolene it is dangerous in either form.

"Pressed gas is not homogeneous," added Mack. "It is satisfactory up to the time the engine is cranked, but not thereafter; it is too lacking in expansive qualities to be satisfactory. It is obtained by the compression of natural gases and varies from 80 degrees to 110 degrees Baume. For the consumer who determines the efficiency of his fuel with a hydrometer, a small portion of this compressed gas mixed with the right proportion of a low grade naptha, say 54 to 58 degrees, would give a fuel of 70 degrees, but the specific gravity is deceiving, and, as stated, the use of such a fuel will be found unsatisfactory.

Influence of "Gas Machine" Companies.

"One of the obstacles to the solution of what is called the gasolene situation, and which rarely is permitted to enter into the reckoning, consists of those companies that build, sell and maintain 'gas machines' to generate illuminating and heating gas for small towns, and factories. The oil companies are under contract, and therefore are compelled to supply these concerns with volatile first cuts, and in some instances intermediate cuts. The result is that the entire distillate is divided into so many fractions or cuts that it is next to impossible for the automobile owner to get a uniform product for his engine. He always may be able to obtain a product that averages the same in density, but in almost every instance it is necessary to change the carburetter adjustment. For instance, today he buys a fuel that tests 70 degrees Baume—this might be a mixture of a certain percentage of 86 degrees Baume mixed with a larger percentage of 58 degrees; tomorrow, or next week, he may get a combination of 60 degrees and 70 degrees distillates. In both instances, the gravity would be identical, but their range or distillation would be decidedly different.

"These mixtures might prove satisfactory if mixed in quantities from 500 barrels upward and by agitation, but they are invariably "mixed" at the distributing station from barrel to barrel. This improper mixture goes to the automobile supply tank, and the result is, generally, that the heavy end settles to the bottom. The supply pipe to the carburetter, being at the bottom of the tank, is liable to contain this heavy product and make starting very hard, particularly on a cold day."

How Engine Designers Can Help.

When the subject of kerosene was mentioned, Mack returned to it with warmth.

"From the engineer's standpoint," he avowed, "kerosene is the ideal fuel. It is richer in heat units than gasolene, which means that it has higher expansion and more power; also it has a more uniform range of distillation and uses a larger portion of air in carburetters. The gas produced is not contaminated with marsh gas and other gases that break up the cycles of hydrocarbon in combustion and is not so susceptible to atmospheric and relative humidity changes.

"Of course, I know that from time out of mind the effort has been in progress to evolve a kerosene carburetter and that the effort has not ceased. I am firm in the belief that sooner rather than later it will be found, but when it is found, or before that time, engine designers must lend their assistance and make necessary alterations in their motors. For the requirements of kerosene fuel, they must conform their motors to a gravity product of 45 degrees to 48 degrees Baume. It may be necessary for them to create a greater vacuum by a later opening of the intake valves, or to increase the compression by a greater reduction of atmospheric pressure, but certainly no great stride will be made until they truly sharpen their interest and do something to assist the producers of fuel and the inventors of carburetters.

Electric Heat for Kerosene Possible.

"Yes, I know all about the complexity which has attended the necessary heating of kerosene in order to render it useful for automobiles, and I am not sure that if some of them set themselves to the task somewhere an automobile engineer will find it possible to heat the fuel above its flash point by using some of the electric current which now goes to waste in almost every car. I do not mean the heating of the induction air, as the air thus heated is partially expanded before it goes to the engine, and, when expanded, air contains in a given atmosphere fewer molecules of the oxygen which is so very necessary in combustion.

"Even with the carburetters in use" progressed Mack for a moment, "the air is heated too greatly and, therefore, is robbed of much useful oxygen. We have all heard the old question, 'Why does an engine run better after sundown?' and the answer is simple: The heat of the sun expands the air and thins the molecules of oxygen in a given atmosphere. In the evening the air is fuller of oxygen and a better running engine results.

Kerosene Would Triple Fuel Supply.

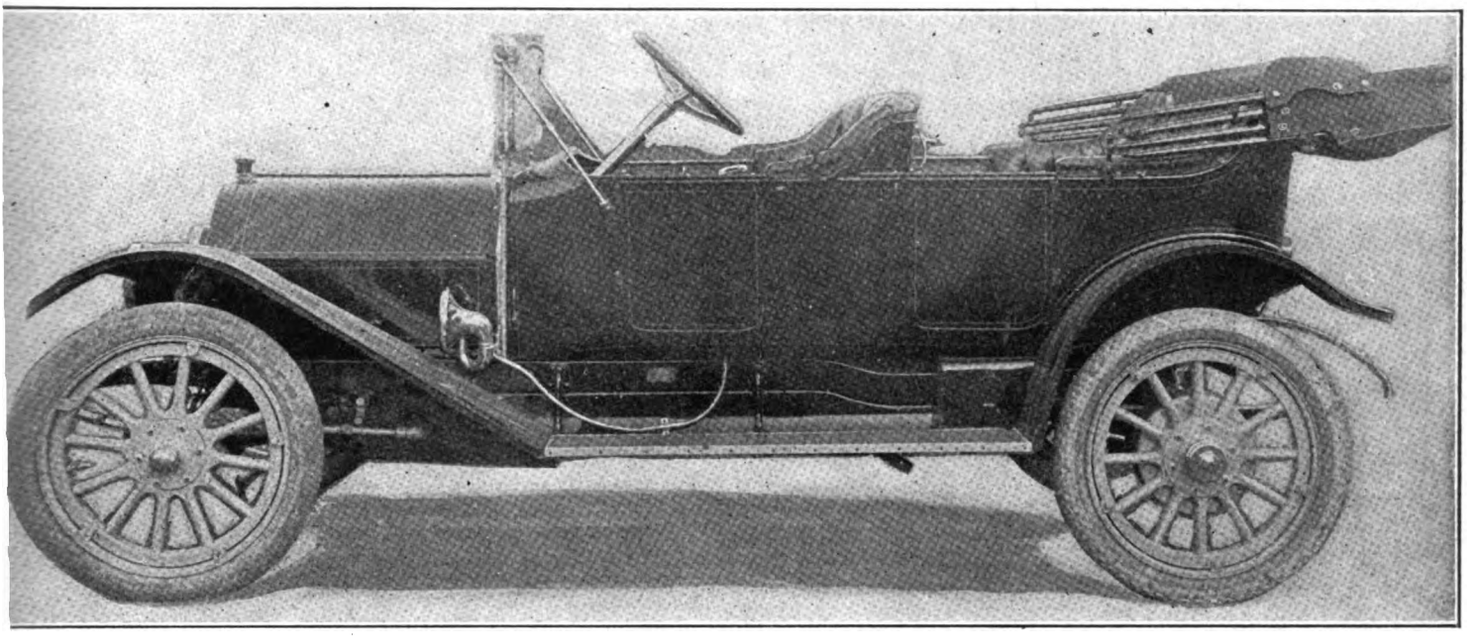
"What the use of kerosene as an automobile fuel means is clear to all who care to see. At present that portion of petroleum is practically a drug on the market, 20 per cent. of the entire distillate of the average crude being kerosene as compared with 3 per cent, which is gasolene of a gravity that is suitable to the man who determines the efficiency of his fuel with a hydrometer. Allowing that 5 per cent. of the total distillate, or one-fourth of the kerosene manufactured, is used for illuminating and other purposes, our present supply of fuel would be multiplied three times. There could be no reasonable excuse given by the oil man for an increase over the present price, provided kerosene were universally used. It could be handled in tank wagon lots instead of the present unprofitable method of delivering gasolene in drums and could be stored in larger quantities without any great risk. Insurance rates, which indirectly have much to do with the high cost of gasolene, would be lowered.

"The opportunities to relieve the situation," concluded Mack, "if not numerous are at least available and fairly simple. As I have endeavored to point out, if the new cuts to which I referred do not relieve the shortage and lower the price for all time then designers simply must adapt their motors to the lower gravities; for if the demand increases as it has increased during the past few years, it is only a question of time when the motor built to run on the present fuel will have to be placed on the storage." "Also," he added as an afterthought, "it must be borne in mind that if too much kerosene or other low grade fuel is produced the supply of lubricating oil which is left after its distillation will become too great to be disposed of and therefore, will prove embarrassing to the producers."

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MORE ROOM AND MORE POWER IN NEW GLIDE CAR

:est Bartholomew Model Built on Lines of 1912 Car with General Enlargement – Motor Brought into Long Stroke Class and Given Higher Horsepower Rating – Electric Lighting Equipment with Dynamo and Gas Starter for Engine Added to Equipment.

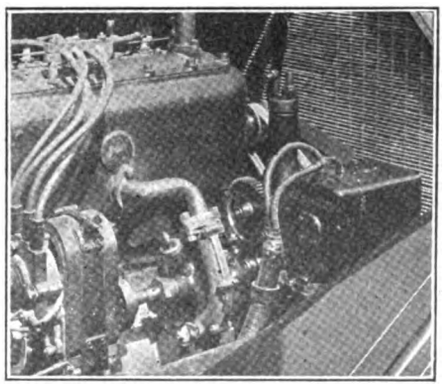


GLIDE 36-42 HORSEPOWER MODEL IN FIVE-PASSENGER TOURING CAR FORM

ncreased size, increased power, more m and more comfort have been provided :he 1913 Glide car, manufactured by the :tholomew Co., of Peoria, Ill. The detures made from previous practice are re in the nature of amplifications than alterations in design, though the motor been brought into the long-stroke class changing the cylinder dimensions from inches bore and 5 inches stroke to 4⅛ hes bore and 5¼ inches stroke. Im-ved construction has resulted in in-ased efficiency, and the rating, formerly horsepower, now is 36-42 horsepower. e increased power propels a bigger car, : wheelbase being lengthened from 114 :hes to 118 inches, the body having been larged proportionately, the tonneau being inches longer and 4 inches wider; logicy, the springs and suspension gear have en made proportionately heavier.

Left hand steering and center control th levers mounted on the gearcase cover, nich were Glide features in the 1912 mod-, are retained in the new car, and the maine is by no means behind the times in e matter of equipment, for it is fitted th a complete electric lighting plant, nsisting of a dynamo driven from the enne and a storage battery, charged from e dynamo, which maintains the supply of uice" when the motor is not running. here is also a motor starter of the acetyne type, the gas for which is supplied om a tank which is used for this purpose aly, the lights all being electric. A power-driven air pump, with sliding gear engagement, is another new Glide feature that carries with it a strong appeal.

The gasolene feed to the carburetter is worked out in an ingenious way that assures feeding even when the car is climbing a steep grade. The main tank, which is under the seat in the case of the touring



GLIDE MOTOR, SHOWING DYNAMO

car and on the rear deck in the case of the roadster, feeds by gravity to a small tank placed quite close to the carburetter, whence the gasolene flows direct to the carburetter. Owing to the proximity of the auxiliary tank to the carburetter no change of level can preclude its feeding; moreover, the small tank is forward of the carburetter, so that in climbing a hill it is on a higher level than the main tank.

A new and considerably heavier steering gear has been adopted, and the axles are stronger; the rear axle now has a pressed steel housing. Both brakes are of the internal expanding type, and the shafts are forward of the rear axle, where they are out of sight. Bevel gears are larger and stronger. Bearings in the front and rear axles are heavier; the roller bearings formerly employed in the rear axle have been replaced by imported ball bearings. The hub flanges of all wheels are of greater diameter and the front wheel spindles are stronger.

The motor has its four cylinders cast in a single block, and the motor and gearset form a unit power plant. The intake manifold is cast integral with the cylinders, and the valve stems are enclosed in a casing with the usual removable covers. All the valves are of composite construction, having nickel steel heads welded to carbon steel stems, the object being to prevent warping and burning under the fierce heat of the exhaust gases. The three-bearing crankshaft runs in nickel babbit bearings carried by the upper half of the crankcase.

Lubrication of the motor is effected by means of a constant level splash system, and in order to insure a constant and copious circulation of lubricant two positively driven pumps are employed with intake pipes so far below the oil level in the reservoir that even when the car is on a 45 degree grade the pumps are not "starved." The main feeds are through copper pipes to

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the timing gears at one end of the crankcase and the main bearing of the crankshaft at the other, and the oil flows thence to the troughs under the connecting rods and overflows back to the reservoir through strainers. The pump valves and the oil strainers all are removable from the outside.

The water in the cooling system, amounting to six gallons, is circulated by a very large centrifugal pump mounted in the right side of the motor. The pump is of bronze, and its shaft is carried on two large bearings, each provided with a stuffing box. A drain cock in the lowest part of the pump housing provides for drawing off water to prevent freezing. All the water pipes, as well as the water jackets, are of large area, providing free circulation and thus tending to maintain uniformity of temperature of the cylinders. The ignition equipment includes a Remy high-tension magneto and a storage battery as an alternative source of current. The carburetter is a Stromberg model 4B.

The three-speed selectively controlled change-speed gear is enclosed in the same housing which covers the fly-wheel and clutch; the clutch, of the multiple disk type, is enclosed in a pressed steel housing of its own which is bolted to the flywheel, the nuts of the bolts being wired in place so that their coming off is impossible.

All the weight on the rear axle is carried on the pressed steel housing, the axle being of the full floating type; the driving shafts are 1⅝ inches in diameter, the same diameter as the propeller shaft. The front axle, which is a steel forging of the accepted I-beam section, has only a slight drop in the center, giving large clearance at this point. The steering knuckles, as well as the wheels, are mounted on ball bearings.

A double drop of two inches in the frame under the tonneau makes it possible to use a body with plenty of foot room w building it so high as to be ungainly frame is of cold drawn channel steel inches deep. There has been a slig crease in spring length; the front spr which are semi-elliptics, are 36 inches while the three-quarter elliptic springs in the rear ar 46 inches lon springs are two inches wide. Heat tre steel clamps with bronze liners are ployed in securing the springs to the a The spring shackle eyes are of phosp bronze and the bolts of steel, hardened ground. The wheels are 34 inches in di eter, with four-inch tires, and are fit with exceptionally large hub flanges for sake of strength. Each wheel has spokes.

Regular equipment includes top with s curtains and boot, windshield, five lam one spare demountable rim, speedome grade indicator, tire carrier and the tool outfit of tools.

MICHIGAN FAIR EXHIBIT SHOWS HOW CARS ARE MANUFACTURED

Several Manufacturers Display Latest Models and Corps of Workmen Fashion Parts and Assemble Cars on the Grounds—Comprehensive and Educational Exhibits from Fifty Factories, Most of them Displayed in Building Specially Erected for the Purpose.

When three years ago the first Michigan State Fair was thrown open to the public at the Michigan State Fair Grounds in Detroit, it housed, among cattle and grain and industrial exhibits and other things which generally go to make up the average State fair, a fairly representative number of automobiles as became an exhibition held in what long since has come to be recognized as the "automobile capital" of the world. The following year, the automobile exhibition was still larger; in fact it was last year that the early fall automobile show in connection with the fair first assumed to really important proportions. This year the exposition of new models is even larger and more comprehensive than ever before, and includes the products of some 50 manufacturers of cars and accessories, an automobile building having been provided to house them. The fair was opened on Monday last, 16th inst., and will hold forth for the rest of the week.

Barring the interest which always attaches to an exhibition of new models, the Detroit show is more than ordinarily illuminating in that it comprises virtually a partial prophecy of what may be expected a few months later at the great national shows in New York and Chicago. All of the manufacturers who occupy space have on view their latest models, designed for the 1913 trade, and in addition, for the edification and education of show visitors several exhibitors have arranged stands which show in detail the various manufacturing steps coincident to the completion of their cars.

Thus, for instance, the R. C. H. Corporation occupies a large space in which are arranged all the parts which enter into the make-up of R. C. H. cars, even to the last nut and bolt. In addition, various parts, such as axles, are shown in partly assembled condition, with factory mechanics working upon them and finishing them. The exhibit includes, of course, a complete line of the finished R. C. H. cars. Another exhibit of the kind which never fails to attract attention, is that of the Ford Motor Co., where there are arranged several of the truly wonderful full-automatic machines with which the Ford factory is equipped. One of them is an automatic piston making machine that turns out four finished pistons simultaneously, and the others are screw and bolt machines. In addition, one Ford car is assembled complete each day before the crowds, and one is taken to pieces. The exhibit is completed by a stripped chassis and four complete machines. The Warren Motor Car Co. also occupies space in the Industrial Building, where the various working exhibits are housed and maintains a small force of factory mechanics engaged in their customary task of assembling Warren chassis on the spot.

In the Automobile Building where the complete cars and accessories are displayed, the Hupp Motor Car Co. exhibits both a roadster of the original Hupp design and the newer $900 touring car. The exhibit of the Chalmers Motor Co. is in the hands of the Neuman-Lane Co., which handles Chalmers cars in Detroit, and includes new models of the "36" and the "54," there being six cars in all. The Clarke-Carter Automobile Co. of Jackson, represented by the Foster Motor Sales Co., exhibits one of the newer model "35" Cuttings, and, as usual, the Studebaker Corporation occupies a very large space, which is well filled with Studebaker "20" and "30" models and the new "20" light delivery car. The complete list of exhibitors and the names of the cars are as follows:

R. C. H. Corporation, R. C. H.; Ford Motor Co., Ford; Warren Motor Car Co., Warren; Chalmers Motor Car Co., Chalmers; Clarke-Carter Automobile Co., Cutting; W. A. Patterson Co., Patterson; Studebaker Corporation, Studebaker; Hupp Motor Car Co., Hupmobile; Briggs-Detroiter Co., Briggs-Detroiter; Cole Motor Car Co., Cole; Thomas B. Jeffery Co., Rambler; Commerce Motor Truck Co., Commerce trucks; Jackson Automobile Co., Jackson; Anderson Electric Car Co., Anderson electrics; Buick Motor Co., Buick; Cadillac Motor Car Co., Cadillac; Regal Motor Car Co., Regal; Federal Motor Truck Co., Federal trucks; Hudson Motor Car Co., Hudson; Hupp-Yeats Electric Car Co., Hupp-Yeats electrics; United States Motor Co., Maxwell and Stoddard-Dayton; Oakland Motor Car Co., Oakland; Mitchell-Lewis Motor Co., Mitchell; Reo Motor Car Co., Reo; Abbott Motor Car Co., Abbott-Detroit; Krit Motor Car Co., Krit; Seitz Motor Wagon Co., Seitz trucks. Among the accessory exhibitors are the Otaka Tire Remover Co. and the Dahl Punctureless Tire Co.

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ARGUMENTS WITH CUSTOMERS AS A PATH TO FAILURE

Dealer Reilly Summarizes His Experiences and Shows How an Argumentative Disposition May Drive Trade From the Salesroom Door—Not Disagreeing With Customers One Way of Retaining Their Good Will—Lack of Argument Need Not Mean Lack of Opinions.

Even though the summer foliage upon the trees was beginning to show those shades and tints which presaged autumn, the electric fan in Reilly's office whirred satisfyingly and swung back and forth between the polished-pated automobile dealer and the factory Sales Manager who, although his mind should have been filled with thoughts of business, had almost succumbed to that affliction which is similar to "spring fever," but which more appropriately is known as "autumn malady." The Sales Manager on his trip through town had stopped to consult Reilly, for this personage who sat at the head of the Sales Department was prone to drag his bright little dealer into the scheme when a sales problem was to be worked out.

Defining a "Bull Moose Business Man."

For a quarter hour the two had sat in near silence, almost too ambitionless to labor at the "ten straights" which had been produced from an inner recess of the dealer's desk. Also there was no conversation from the newsboy, who, hurrying on his evening route, shied a paper into the office, the sheet coming to rest upon the desk in such a position that it required but a minimum of effort for the Sales Manager to move it so it was right side up; he looked at the front page—to have looked at page 2 would have required too much exertion. Neither spoke as the two continued to sit under the spell of languidness which seemed to have fallen simultaneously upon both. The Sales Manager, however, did that which required but little effort and read the inch-high headlines upon the paper; there blazoned in the printer's blackest handiwork were the latest doings of the "Big Bull Moose."

"Reilly," said the Sales Manager, "are you a 'Bull Mooser?'"

"A bull whater?"

"A 'Bull Mooser,' a Progressive," answered the salesman.

"Do you mean politically or in a business way?"

"In a business way?" said the Sales Manager, "What kind of talk is that? Who ever heard of a Bull Moose business man?"

"I did," remarked Reilly. "I'm one myself. Bull Moose in business, but in politice—s-s-sh!" And he held up his hand commanding a mysterious silence.

"Trying to kid me?" asked the Salesman.

"No, honestly, I'm not. You asked me if I was was a Bull Moose—which is only another word for Progressive. Progressive is not necessarily confined to politics, and I chose to adapt it to myself as a business man; you must admit that progressiveness in business is as valuable as in politics."

"O, I'll concede that; but what are you politically?"

"Never Argue" as the Dealer's Motto.

Reilly smiled slyly and briefly replied, "An Irishman."

"Well, I'll admit that you have a large party; but what's the matter with you? Are you ashamed of your politics, or haven't you any?"

"I don't mind telling you," said the dealer, "that I was brought up a Republican, but politics is something I never drag into business. I get so in the habit of replying evasively that it's second nature. You undoubtedly fail to regard this matter as seriously as I do, but I have reasons; there is one motto that every man who depends upon the public for a living ought to remember, and that is 'Arguments about politics and religion never arrive anywhere—also they may do much harm and lose him many friends.' And paramount to the whole proposition is the motto, 'Don't argue at all.'

"If a business man goes about flaunting his politics he is sure to run against people who are of an opposite faith, and that always results in more or less of argument. You can argue all day with a man who disagrees with you in politics, and even though one of you may apparently have the advantage in the discussion when it is all over, both of you still retain the same beliefs, and the man who is beaten is 'peeved.'

How Argument Lost a Customer.

"I never was much of an arguer, anyway, but I, however, have seen a great many ill results from an argumentative disposition. I hadn't given it much thought until several years ago, when I saw another dealer lose a rattling good customer just through arguing. The customer was a Baptist and the dealer was a Methodist; they were good friends for a long time, and the Baptist had bought one or two cars of the Methodist; they were such good friends that the customer very often stopped in to call on the dealer for nothing else than to pass the time of day. But one day it happened, and I don't know why it hadn't happened before. The Baptist stopped one day and the two of them drifted around to a conversation about theological affairs; the Baptist veered the argument to the creation of man, and insisted in his belief that the first man turned out was Adam, and that he was a perfect man, just picked up and set down in the Garden of Eden to start the race. The other fellow, however, had long believed in the Darwinian theory and attempted to explain that the development of man from a monkey was more logical and in no wise disagreed with the scriptural narrative of the beginning of things. Of course you know how 'set' men get in beliefs like this, and neither would give in. Both grew pretty hot and it wound up by the Baptist calling the Methodist a 'damned heretic,' and when the Adam-in-the-Garden-of-Eden faction barked his knuckles trying to shift gears in his haste to start the car he almost exploded in his righteous indignation. He uses another make of car now. That argument cost the dealer several hundred dollars a year.

Discussing Merits of Rival Cars.

"Even on the matter of merits of cars, I believe it is bad policy to get into heated arguments. Very often people come in and it looks to me as if they were seeking only to try to show me up, to brag about the good points of some other car and try to see if they cannot drive me into a hole in the argument. What's the use of trying to convince them that the cars they are boosting are not good ones; they certainly are good ones. When such an individual shows up there is nothing I can do but admit that the good points he is shouting about are good points and that the car in question is a good reliable vehicle; in fact, there are so many reliable cars on the market today that it is foolhardy to contend that any one of them is paramount and superior in all respects. Such stuff might have got by some years ago—but no more.

"If you agree with a man that he is right and that the car he has mentioned is a good and proper sort of a wagon, he is better inclined toward you and will give you an opportunity—or you can make the opportunity—to get in a few words and begin to get him interested in the points and construction of your own car. There are details of construction of cars that few owners are familiar with and a good salesman generally, when the equipment and leading features of two cars are quite similar, often can work up an interesting story on some factory process which gives superiority in building or can weave a tale which, while

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not disagreeing with the prospect's previous contentions, will draw his mind from that other car, and before he knows it he is beginning to be convinced that your car, in spite of his love for the other, is a good buy; and inasmuch as the other car is not present and unable to talk for itself, the prospect is quite likely to be inclined to switch over and agree with you, even though he came in determined to disagree. If you had disagreed with him at the very start there would have arisen a barrier of hostility that never could be broken down.

No Need to be a Jellyfish.

"But to get back to the original question; I don't mean to say that a man in business need be a boneless, jellylike sort of an individual with no opinions and with no political or religious faith. What I do mean is that he need not necessarily hang a sign on the front of the building proclaiming to the public that he is a Baptist or a Democrat or favors the recall of judges. I hold all sorts of opinions, and I even mix in certain movements now and then, but a man can do all of that and still be liked by people who do not believe as he does; what raises the ructions is coming into close contact on the question and rubbing the man the wrong way by getting into an argument with him.

"If questions of argument must come up, it is just as well to let the other man start the argument; and if you don't jump right in and keep the pot boiling it is not going to get very hot. You may even tell the man that you have believed so and so, but if he at that statement rises up in his self confidence of believing himself right and declares he is right and you are wrong, it is best to inform him that you have not made a specialty of studying the particular point at issue, and that while you have believed so and so, he may be in the right. What makes him hot—red hot—is to have someone tell him he is wrong.

Changing Subject a Fine Plan.

"At that, it is hard to follow the correct course always. Some people like a man who has opinions and have the greatest contempt for what they term a spineless jellyfish, a man who never has an opinion. When undecided as to what to do, the best thing is to change the subject; and I have found that the safest course in any event is not to argue. It is the best way in the big majority of cases. I don't mind arging with you, because we're too good friends to scrap; we know each other well. We've quarreled a little now and then, but always made up, so I guess we can do so again if need be."

"Well," said the Sales Manager, "seeing that you don't mind arguing with me, suppose we get into a discussion of that used car scheme I came down to talk with you about."

"Aw, forget that for the present; it's supper time. Come up to the house and we'll talk it over then; you're in no hurry to get back."

While Reilly chucked papers into the desk and made ready to depart, the Sales Manager stood in the front doors when the setting sun, which all day had transformed early Fall into Summer, took a last slap at the salesman, whose collar showed a moist and softening wrinkle at the top. The Sales Manager was mopping his brow and studying the thermometer as Reilly came from the office.

"It's a very cold day," the salesman commented.

"Cold as hell; think it's going to snow," agreed the agreeable Reilly.

THE "BALANCED" TIRE; WHAT IT IS AND ITS FAR-REACHING INFLUENCE

Its Development Explains the Failure of the Unending Army of "Substitutes for the Pneumatic"—Goodyear's Factory Manager Points Out Basic Principle Left Unconsidered by the Members of the "Substituting" Army.

Balanced automobile engines have been much exploited, and the balancing of the whole car itself has received legitimate attention by reason of its undoubted effect on maintenance cost, but that the "balance" of tires is a feature not to be despised or minimized is a fact rarely considered either by those who sell automobiles or those who use them. But that the balanced tire does exist, and exists in a really logical manner, is brought out by P. W. Litchfield, factory manager of the Goodyear Tire and Rubber Co., of Akron, O., in one of the series of illuminating talks in which he has indulged.

"In designing a pneumatic tire for an automobile," says Litchfield, "it should be with the idea of making it cost the consumer the lowest possible amount per mile of service consistent with properly performing its functions. In order to accomplish this, all parts should be of equal strength, so that, if possible, it should be like the one-horse shay—when it is worn out, all parts should wear out at once. It is only by study and experience and by continually strengthening the weakest part, that it can be brought to this position. The carcass, fabric, friction, breaker strip, tread rubber, inner tube, type of rim, character of roads, speed, and weight to be carried, all have to be given consideration. It is very easy to strengthen some one part, such as making a longer wearing tread, a better wearing carcass, a more puncture proof tire, etc., but it is very difficult to do this without weakening some other feature, or at least nullifying the effect of the improvement by some other part not lasting as long as the part improved. This would, therefore, be of no advantage, and would probably increase the cost of the tire as well as the cost per mile.

"A glance over the list of failures in the tire business should convince everyone of the value of the balanced tire over the one-idea tire. Think of the number of concerns which have started out with flying colors to market a puncture proof tire, concentrating all their designing on this one idea, only to find out that, although they have succeeded in preventing puncture, they have weakened the tire in some other part, so that the cost per mile to the user more than offsets the advantage of being free from punctures. Think of the heavy treads which have been put upon tires which would wear from 20,000 to 30,000 miles, when the carcass under them would not last one-tenth as long. Think of the thick-wall carcasses with ten or twelve plies of fabric to prevent blowouts, which have gone to pieces in a few hundred miles, owing to the heating and disintegration caused by friction generated as the tire revolved along the road. Think of the fabric reinforced inner tubes which have gone to pieces because they were trying to perform the functions of both the casing and the inner tube, failing to perform the functions of either well.

"Think of the self-healing tubes which have been put upon the market, to self-heal in event of puncture, which have proven impracticable owing to the difficulty in repairing them in case of pinch or blowout, as well as their increased cost. Think of the cushion tires where the casing is filled with a bridgework of rubber to do away with compressed air, which have gone to pieces due to excessive friction and heating; also, think of those filled with metal in the form of springs which crystalize and cut the casing to pieces. All of these types and many others were designed with the one idea of correcting some known defect in the pneumatic tire without giving due regard to preserving the good points of the present standard tire.

"In spite of all of the new devices and patents, which are constantly being brought to our attention, there is nothing yet which seems to have sufficient merit to give it the slightest chance of replacing a well balanced pneumatic or solid rubber tire."

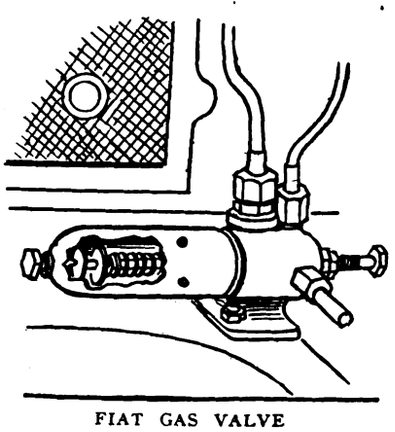
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FEEDING GASOLENE FROM LOW-HUNG TANKS

How Modern Body Construction has Forced Development of Pressure Feed—Some of the Pros and Cons of Pressure and Gravity Systems—Cleaning the Exhaust Gas and Putting it to Work—Varied and Ingenious Methods of Pumping and Regulating Air.

Coincident with the constantly lowering center of gravity that has marked the development of the motor car for the past year or two, there has occurred more or less difficulty in placing the gasolene tank in such a position that it will feed to the carburetter with regularity and with sufficient head to ensure a good flow when the tank is nearly empty or when the car is ascending a grade.

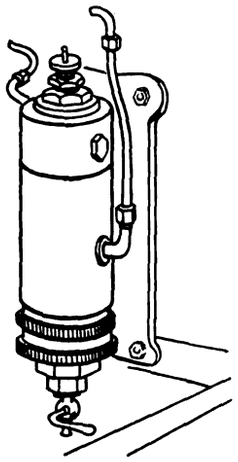
In the days when practically all bodies were high in the air, the tank under the seat could be relied upon to feed the carburetter adequately under all conditions; but now even with the motor hung as low as is practicable, and with the carburetter dropped as far as is permitted by considerations of efficiency of carburation, there are many bodies that are so low that the



FIAT GAS VALVE

tank under the seat is not high enough. Especially is this the case with low-built cars of the roadster types, many of which, moreover, are fitted with seats so near the floor as to leave nothing like the space required for even a moderate sized fuel container. And beyond all this is the fact that the space under the seats often is wanted for storage purposes.

Considering the restrictions imposed by current construction of bodies and frames, it is by no means illogical that there should be a very considerable and increasing number of makers building cars with gasolene tanks hung in the extreme rear, low down between the ends of the main frames; the tendency in that direction is well defined. To raise the fuel to the carburetter it is only necessary to create pressure in the tank, which is readily done by pumping in air or else by admitting a very small portion of the exhaust gases, properly cooled and freed from impurities which might make trouble either in the feed pipes, pressure pipes or in the carburetter. As might be expected, the cars in which pressure feed is employed are not the lower priced cars. As a rule the "little fellows" are so designed as to lend themselves readily to gravity feed arrangements, for the pressure feed system is not conducive to inexpensive construction; the tanks and fittings must be air-tight and remain so; there is considerable piping to install, and it must be properly placed and fitted in order to

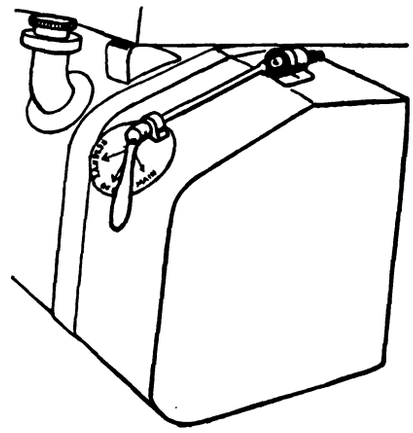


MATHESON GAS STRAINER

avoid leakage; and there is either a pump, with its driving mechanism, or a special set of valves and a "scrubber" when exhaust pressure is employed, all of which cost money—a good deal of it, in some installations.

The chief advantage claimed for pressure feed to the carburetter is uniformity of flow under every condition. Whether the pressure in the gasolene tank is produced by air or by exhaust gas, there always is a regulating device which either cuts off the supply when the pressure reaches the predetermined maximum, or else opens an outlet and permits the excess to escape. The degree of pressure used in various systems varies from a pound to two pounds to the square inch, the average being about a pound and a half. With the system working properly the pressure will be maintained uniformly, and the rate of flow to the carburetter also will be maintained, regardless of the quantity of gasolene remaining in the tank and despite ascending grades.

It is pointed out by the opponents of the pressure system that in case of the derangement of a pump, or the leakage of any part of the system, or the obstruction of any one of the necessarily long pipes that lead from front to rear of the machine, the motor will be effectually stalled, and that there may be considerable difficulty in locating the trouble, to say nothing of remedying it when found. On the other hand, however, it is maintained by the pressure feed fraternity that the proof of the pudding is in the eating thereof, and that the pressure feed system works very well indeed. The pressure carried is very low, so that there is no question of troublesome strain from this source; workmanship, design and materials are better than they ever were, which means that pumps and other



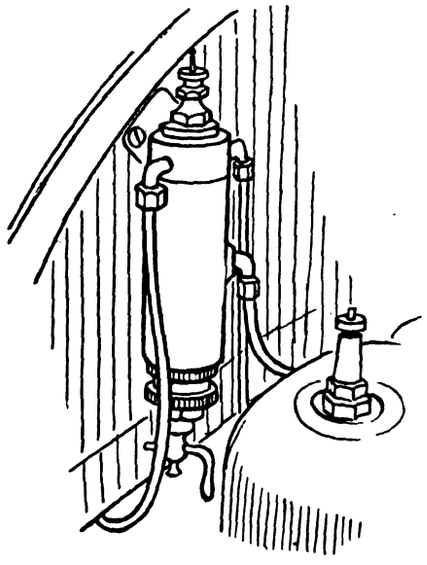
PEERLESS TANK VALVE

moving parts of such systems can now be depended upon to do much better work than earlier models; and in all cases where exhaust pressure is employed the gas is so thoroughly cooled and screened that it has little or no chance to cause trouble, as long as the little "scrubber" is given an occasional cleaning out.

There can be no question but that the exhaust pressure system is the simplest that can be used, for it involves absolutely no moving parts other than the check valves and pressure regulator. The Fiat which now is an American-built car, has used exhaust pressure fuel feed for years, and has brought it to a point of simplicity and efficiency that would seem difficult to surpass. The exhaust gas is led through a small copper pipe tapped into the exhaust manifold near the rear end of the motor into the pressure regulator, which is nothing but a small horizontally positioned cylinder with a spring-pressed piston in it. The gas is

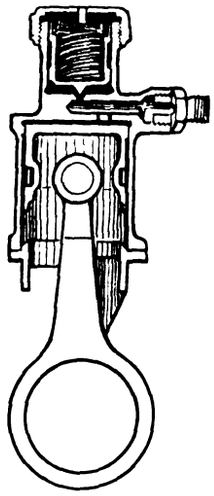
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admitted to the cylinder on the side opposite the piston spring, so that the pressure pushes the piston back against the spring. The higher the pressure rises the further the piston is moved, until it reached a point where it uncovers several small holes drilled in the cylinder wall. When this occurs the gas of course escapes until the pressure is relieved enough to let the piston return and cover the holes. This means that the pressure never can rise higher than is sufficient to overcome the resistance of the spring tending to keep the piston over the holes; by regulating the tension of the spring, which is readily done by a milled nut on the end of the regulator casing, the pressure required to force the piston back can be made anything desired, within the capacity of the spring. Two pipes lead out of the regulator, one connected to a dashboard gauge which shows the pressure and the other direct to the gasolene tank. Between the supply port in the regulator, into which the pipe from the exhaust manifold is tapped, and the two outlets, is a manifold screen of very fine wire gauze which effectually prevents the passage of solid matter and is removable for cleaning. By the time the cleansed gas has traversed the long tube back to the tank it is quite cold. As in all pressure feed systems, there is a hand pump which is used to pump up the pressure in order to get a flow of fuel to start the car. In the case of the Fiat this pump is mounted on the dashboard.

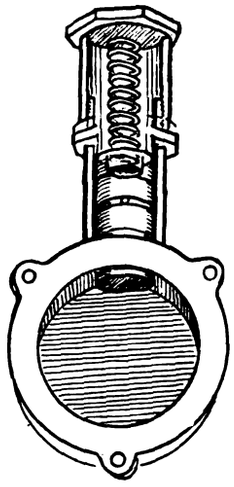


PALMER-SINGER REGULATOR

In the Matheson car the same principle is employed, though it is worked out in a somewhat different way. The cylindrical pressure regulator is carried in a vertical position on a bracket at the rear of the motor, and takes gas through a short copper tube from the exhaust manifold. Entering the regulator near the top, the gas is conducted to the bottom through a narrow spiral passage which winds around between the casing and an inner shell; this robs the gas of most of its heat and also gives carbon an opportunity to settle. At the bottom the gas passes upward into the central shell, which contains a wire gauze strainer which completes the "scrubbing" of the gas. From the casing on the side opposite the inlet the outlet pipe leads off; the pipe is branched to the dashboard gauge and to the hand pump. At the bottom of the regulator there is a small settling cup for catching the water of condensation, which is drained off through a pet-cock. By removing the outer casing, which is easily done by unscrewing it by its milled lower flange, the spiral passage is laid bare for cleaning. The effectiveness of this method of cleaning the gas is indicated by the fact that after being in use for some time there will be a deposit of carbon near the top, where the gas enters, but the deposit becomes thinner toward the bottom, until the metal is almost quite clean where the gas leaves the spiral to enter the strainer. A similar arrangement is used on the Palmer-Singer car; the regulator is mounted on the motor side of the dashboard, however, above the tops of the cylinders. In both installations the pressure is regulated by a small valve with an adjustable spring, the effect of which is to cut off the supply of gas from the exhaust manifold when the pressure reaches the maximum for which the spring is set. This of course means that no gas passes through the device except what is required to keep up the tank pressure.



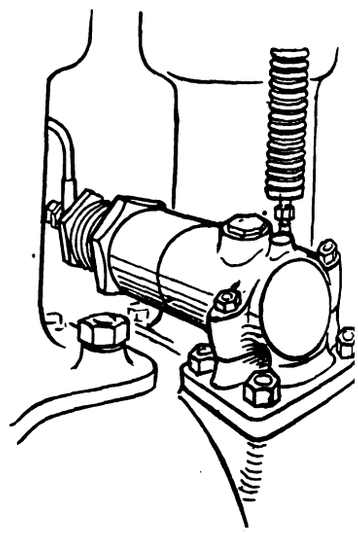
PACKARD PUMP



AMERICAN PUMP

There is little opportunity for variation in the methods of using exhaust pressure, but of air pumps there is variety without end, and no little skill and cleverness are brought to bear in working out satisfactory devices. A rather striking example is the air pump of the Lozier car. In this system it is sought to avoid the multiplication of wearing parts as much as possible, and by way of making one part do the work of two a pump is evolved by enlarging the proportions of one of the valve lifter guides to form a cylinder and making the lower part of the lifter fit the cylinder as a plunger; the result is a pump in which the only extra parts are a couple of little pist and the check valves and regula latter contained in an exterior fittin limit of pressure is set by mean screw cap on the top of the valve c

The employment of compressed ways has been a feature of Winto and gasolene feed by this means seer logical under the circumstances. plunger pump is used, driven by an tric which is mounted on the cra between the rear crank and the The pump is set into a recess cast purpose in the side of the crankcase readily removed by taking out th cap screws that hold it in position pressure in excess of the two pour quired is blown off through the sprin ulated valve in the pump head. A arity of the Winton system is that gauge is employed, the reliability



PEERLESS PUMP POSITION

pump making visible evidence of the p sure unnecessary. Another Winton feat is the use of a small auxiliary tank mou ed on the dashboard, to which the ga lene is forced by air pressure and fr which it flows to the carburetter by grav The tank is fitted with a float and nee valve, exactly like the valve arrangem of a carburetter, and this results in treme constancy of pressure on the c buretter, for the head of gasolene is ways that of the full auxiliary tank, regar less of slight fluctuations in air pressu Moreover, there is gasolene available f starting the motor even if there is no pre sure. The tank holds sufficient fuel to ru the motor much longer than is necessar to get up pressure in the main tank. Inc dentally, the lubricating oil pump is op erated by the same eccentric that work the air pump.

The Packard system includes an air pump driven by an eccentric on one of th camshafts and an automatic pressure re lief valve which is located under the floor boards, in the pipe line. The pump is of the piston type; the discharge is connected to a chamber, integral with the cylinder

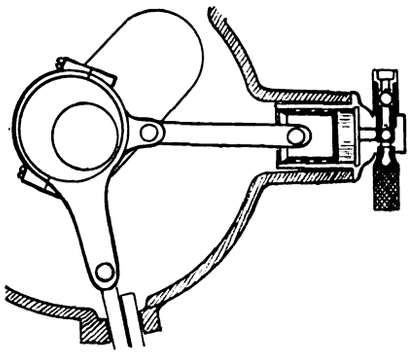
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head, in which there is a spring-backed piston which is forced upward by the pressure of the air, the effect being exactly the same as if the clearance of the pump cylinder were varied. This automatically takes care of the regulation of pressure, while the relief valve in the air line acts as an additional safeguard, preventing any possibility of excessive accumulation of pressure. The system is completed by the usual air gauge and a hand pump for starting. The entire system is installed with a great deal of care, and there are many indications of the pains taken to ensure reliability and minimize the possibilities of derangement.

A special cam mounted on the exhaust camshaft operates the spring-returned plunger of the air fuel-feed pump of the National car. The pump is bolted up to the side of the crankcase opposite the cam in a horizontal position, lugs being cast on for the purpose. The pressure is regulated by adjusting the clearance space, or, rather, by adjusting a chamber that is formed at right angles to the cylinder and closed by a screw cap. The principle is exactly the same as in pumps having adjustable cylinder heads, but the L form makes a short and compact construction. A spring detent holds the screw cap in position, but permits its being turned to make adjustments.

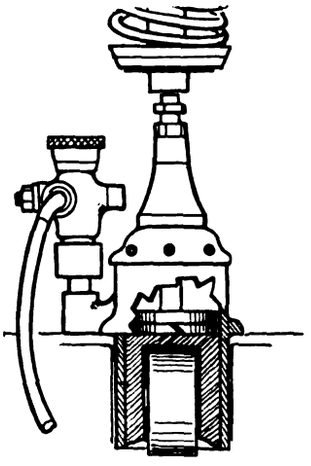
While only one of the Peerless cars, the torpedo, employs air pressure for fuel feeding, the arrangement is an interesting one. The pump is mounted on the crankcase, just above the inlet camshaft, and is driven from a short vertical shaft which, in turn, is worm driven from the camshaft. The pump is installed in a horizontal position, extending between the cylinders. The limit of pressure is regulated by the simple expedient of adjusting the clearance between the piston and the cylinder head by screwing the cylinder head up or down; the more clearance there is the lower will be the pressure, and vice versa. An oil cup on the top of the pump cylinder provides for lubricating the piston. Inside the gasolene tank there are two connections to the gasolene feed pipe, both controlled by a small handle on the top of the tank. With the handle in the regular running position, the gasolene will stop feeding when there still are about five gallons of gasolene remaining, the object being to warn the driver that his supply is nearing depletion. Turning the handle to the second position permits the use of all the fuel, while the third position shuts off the flow altogether.

An air pump that is similar in the main features of its construction to a two-cycle gasolene motor is employed in the fuel feed system of the American underslung car. The pump piston is operated by an eccentric which bears directly on the inner end of the piston, there being no connecting rod; the piston is returned by a helical spring. The eccentric is carried on the end of a camshaft, which is brought out through the rear end of the crankcase for the purpose, and the pump is bolted on with the part that corresponds to the crankcase of a motor over the cam on the



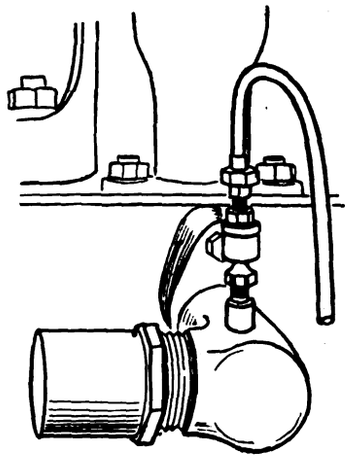
WINTON ECCENTRIC DRIVE

camshaft. The air intake is through a port in the side of the cylinder which is uncovered when the piston nears the bottom



COMPACT LOZIER DESIGN

of its stroke, just as the piston of a two-cycle motor uncovers its intake port. The adjustable cylinder head is used to regu-



NATIONAL "L" PUMP

late the pressure by varying the compression space, the principle being the same as in the Peerless pump.

The Herreshoff car is one that may be said to occupy a sort of middle position in the matter of fuel feed. That is to say, while gravity is relied upon for fuel feed under ordinary conditions, there is a hand pump that can be used to raise pressure in the tank in case the car must climb a hill so steep that the carburetter is likely to be "starved"—which is a possibility where the grade is very stiff and the tank almost empty.

Ingenious Decompressor from England.

Despite the fact that it has been proven beyond cavil that less power is required to "crank" an engine with the compression unimpaired than it is to crank it with the compression released, compression releasing devices that are more or less ingenious still continue to appear with scarcely an abatement. One of the latest to be brought out—probably it is one of the most ingenious, also—is the Endrick decompressor, which just has been placed on the market by the Endrick Engineering Co., of Olton, England. In its simplest aspect, it is merely a cylinder enclosing a small poppet valve, the whole being arranged for insertion in a properly tapped hole in the valve cap. The poppet valve is held to its seat by means of a light spring when the device is in operation, the modus operandi being as follows: When the engine is to be started, a small knurled knob at the top of the device is turned in an anti-clockwise direction, which action serves to release the valve; it then is held to its seat by means of a spring. When the engine is "turned over," the compression beneath the valve raises it off its seat and permits part of the compressed charge to leak out. Immediately the engine takes up its own cycle of operations, the small knob is turned to the right, which locks the valve on its seat and the compression remains as if the device had not been fitted.

Converting the Hydrometer's Readings.

A reading taken on a Baume hydrometer can be changed to read in terms of specific gravity by using the formula

$$\frac{140}{130 + B} = S.$$

Specific gravity, on the other hand, can be converted into terms of the Baume scale by the following: $\frac{140}{S} = B$, in which S is specific gravity and B is Baume.

Neat Method of Repairing Piping.

A very neat repair of a copper or brass pipe can be made by tinning the pipe where it is to be repaired and a short distance on each side, wrapping it closely with rather fine copper or brass wire and finally smoothly tinning the wire, making the solder fill all the interstices. If the wire is not too heavy and solder is used with an economical hand, the joint will be very little larger than the pipe and will not look at all clumsy.

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STUTZ IS LATEST IN SIX CYLINDER FIELD

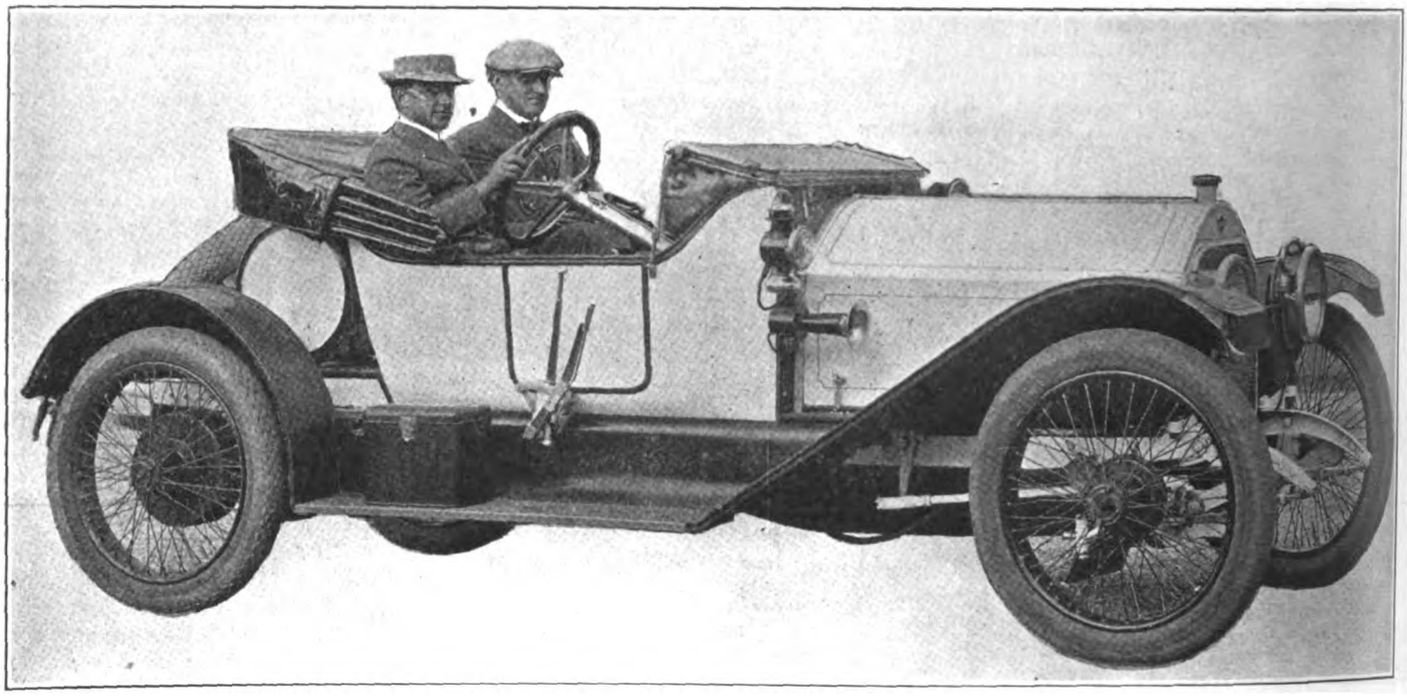
Indianapolis Company Brings Out Larger Model of Sixty Horsepower—Lists at $2,300—New Cars Are Roomier.

Following the trend of the times, the Ideal Motor Car Co., of Indianapolis, Ind., has added a six-cylinder model to its line; it bears the name Stutz, of course, and the name which was made almost in a day, is worthy of the car. It is being made in both roadster and six-cylinder touring car form, the only difference in the chassis being in the length of the wheelbase, which stands at 124 and 130 inches, respectively. So few and of such minor importance have been the changes which it has been deemed expedient to make to the four-cylinder models that the line is continued under the Series B caption; the six-cylinder cars also are known as Series B cars.

The motor of the latest addition is of the same general design as the motor employed on the four-cylinder Stutz, but the bore and stroke stand at 4¼ by 5 inches, respectively, as against 4¾ x 5½ in the four-cylinder car. Sixty brake horsepower is developed at the normal crankshaft speed. The T-head type cylinders are cast in pairs and, as is the case with the four-cylinder motor, large valves, ample water jackets, hollow crankshaft oiling system, and four bolt connecting rods, are among the desirable features. By way of preventing undue vibration which, differently stated, means undue strain on the crankshaft, when the motor is turning up at a high rate of speed, four long bearings are provided. Ignition is effected by means of an Eisemann dual magneto supplemented by the usual coil and storage batteries. Cooling is by means of pump circulation embracing the use of a large honeycomb radiator and the usual belt driven fan; force feed oiling obtains. A Stromberg carburetter is provided.

Power is transmitted to the rear wheels through the intermediary of a multiple disk clutch operating in a bath of oil, the orthodox propeller shaft and a three-speed ahead and reverse selectively operated gearset located on the rear axle. Two sets of brakes, both of the internal expanding variety working on rear wheel drums of ample dimensions to ensure efficient braking are supplied. The service brakes only are equalized. As is the case with the four-cylinder models, semi-elliptic springs are provided both front and rear, and although the springs are of ample length to ensure the promulgation of the easy riding qualities which ever were evident in Stutz cars, velvet auxiliary springs are provided further to increase the springing efficiency. Baker demountable rims are fitted to the 34-inch wheels. As heretofore, the four-cylinder models are put out in three body forms, mounted on identical chassis except for the wheelbase, which stands at 120 inches for the roadster and 124 inches for both the four and six-cylinder touring cars. With the single exception of a slight change in the design of the intake manifold, which now is made of copper and jacketed so that the mixture is slightly heated by the water from the cylinder jacket which makes for more regular operation, especially in cold weather, the motor remains intact. Bore and stroke are 4¾ by 5½ inches, respectively. The rear end system, however, has been slightly changed, and all of the parts made larger. A full floating type of rear axle has been introduced, which embraces the use of an outside adjustment for shifting the mesh of the bevel driving pinions. Right hand steer and control persist in both the "four" and "six."

As evidence of the manufacturer's progressive policy, all of the bodies have been made roomier, and the upholstery made deeper and more comfortable. Equipment comprises Esterline electric lighting system, Tuto electric signal, together with the usual complement of tools, spares, etc. Prices range from $2,000, which is asked for both the four-cylinder roadster and the four-passenger touring car, to $2,300, the price of the six-cylinder touring car. The larger four-cylinder touring car and the six-cylinder roadster sell for $2,050 and $2,300, respectively.



SIX-CYLINDER STUTZ CAR FITTED WITH McCUE WIRE WHEELS—H. C. STUTZ AT THE STEERING COLUMN

Lever Positions That Facilitate Operation.

Modifying slightly the design of closed front bodies in which control levers are placed inside instead of outside, the manufacturers of Argyll cars, which are of foreign manufacture, have adopted a simple and novel method of reducing the hazard of driving. Instead of placing the gear shift lever next to the driver, the emergency brake lever has been placed in this position with the gear shift lever on the far side of it. In this way the brake lever is rendered more accessible and, inasmuch as the driver then can exert a straighter pull upon it, less exertion is required to obtain the requisite braking strain and the maximum pressure can be obtained without trouble. The arrangement is such that the brake lever is in direct line with the operator's right shoulder.

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GREATER COMFORT IN STANDARD ELECTRICS

Luxuriousness, Which Means Larger Bodies and Tires and Longer Wheelbase, Keynote of Revision.

When the Standard electric pleasure car was evolved by the Standard Electric Car Co. of Jackson, Mich., much that heretofore had been foreign to electric cars but which had proven of material benefit in the construction of gasolene vehicles was builded into it. And as it was a brand new car all the way through and as the engineers who were responsible for it were progressive in the true sense of the word, it goes without saying that such old features as were adopted and such new ones as were incorporated represented as close to the acme of perfection for the service as it is possible ever to reach. At least such is the impression given by the later models which now are coming through the factory, for though a number of notable improvements in general have been made, radical departures from previous practice are conspicuous by their absence.

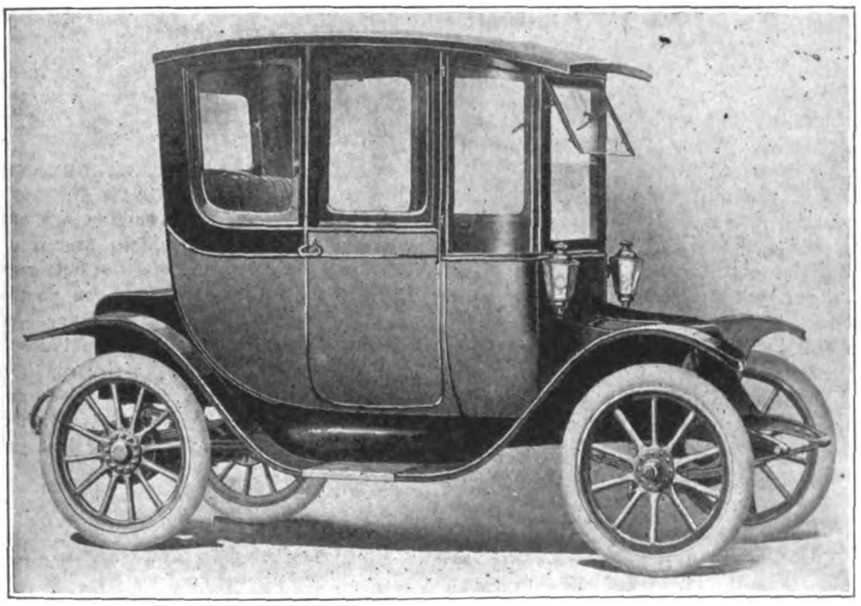
Briefly, the alterations which have been made can be summed up in three sentences: The wheelbase of the chassis has been increased from 93 inchs to 96 inches; the size of the rear tires has been increased from 32 x 3½ to 33 x 4 inches; the bodies are larger and roomier and by reason of added equipment and careful design have taken on an even greater appearance of luxuriousness. Of course, the increase in the wheelbase length tends to increase the easy riding qualities of the car. Incidentally, making larger the rear tires, which carry the greater part of the passenger load, also has a material bearing on the comfort of the passengers to say nothing of the increased tire life which is gained.

Another important feature which has figured in the revision and which may be expected to bear definite relation to upkeep cost is that bodies now are constructed entirely of aluminum. Nearly everyone who has had experience knows that it is a much more simple matter to repair an aluminum body in case of accident than it is to repair a wooden one. Added to which there is the advantage of the lighter weight of the metal body. As every pound of weight that is added to the chassis requires an equivalent amount of power to propel the vehicle, every decrease in weight legitimately may be expected to add to battery mileage. Bodies are larger than they were in earlier models. Though the seating arrangement is such that but four passengers nominally are provided for, the increase in size makes it a comparatively simple matter for five persons to find accommodation. The front seat in particular is considerably wider than it was, the concrete result being that the view of the driver is less obstructed. Instead of the glass front that was used in the past, a clear-vision shield now is provided, the lower section of which drops into a pocket in the paneling; the upper section is arranged so that it may be swung upward and outward, affording protection to the occupants in inclement weather. Throughout the car, the greatest care has been taken to insure a most perfect finish on all metal and painted parts and the result is reflected in the product.

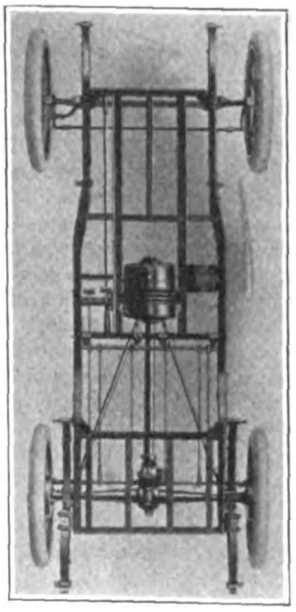
As regards the mechanical features of the car, it might almost be said that no changes whatever have been made. Those that are apparent are merely in the nature of detail refinements such as might be expected in the product of an up-to-date manufacturer, and are by way of increasing the smooth operation and reliability of the ensemble. The electrical apparatus, barring only the battery, is the product the the Westinghouse Electric & Mfg. Co., whose name in itself is sufficient guarantee of quality. The motor is of the high-speed type, and is rated at 48 volts and 26 amperes. By way of providing for rugged serviceability, it is completely enclosed in a substantial metallic housing and scarcely requires more attention than a watch. The armature and commutator are small and light, thus reducing the total weight of the motor and eliminating much of the peripheral speed and the action of centrifugal force.

The controller is of the constant torque type for which the Westinghouse company has become famous, and is located above the chassis frame where it is instantly accessible for cleaning or for the replacement of fingers should this be necessary after long service. By reason of the arrangement of the contacts, jerks and jars as the various speeds are connected, are eliminated and the drive is perfectly smooth from the lowest to the highest speed. There are six contact points on the controller corresponding to as many speeds forward; three reverse speeds are provided. The handle of the controller is placed convenient to the operator's left hand, the steering lever being arranged for left drive. These two levers, together with two brake pedals which operate separate sets of brakes on the rear wheels, constitute the whole of the control apparatus.

The drive from the motor to the rear wheels is direct, even the single universal joint which almost is inevitable having been eliminated. The reason for the elimination, of course, is to be found in the



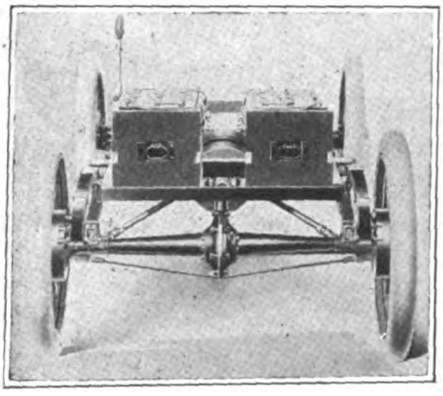
REVISED AND ROOMIER STANDARD ELECTRIC COUPE MODEL



CHASSIS IN PLAN

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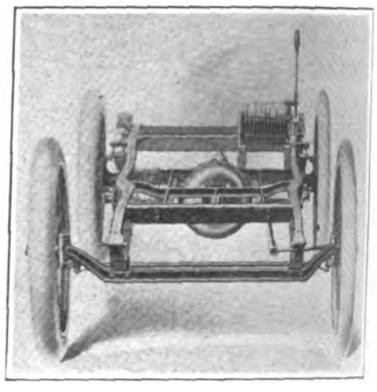
method of motor suspension, which is unusual and permits of the requisite degree of rigidity without sacrificing flexibility. The torsion tube which encloses the driving shaft is fastened at the forward end to the motor casing, the latter being trunnion mounted so that it may move in practically any direction to conform to the movements of the rear axle as the wheels pass over road obstructions. The rear end of the torsion tube is firmly bolted to the



STANDARD BATTERY POSITION

housing, which encloses the differential gearing, and the distinctive type of double reduction gearing which is exclusive with the Standard electric car and one other gasolene commercial vehicle. The motor is further tied to the rear axle by means of two diagonal strut rods which ensure positive maintenance of the proper relationship between the rear axle and the power unit. Inasmuch as efficient transmission design virtually is the life of an electric vehicle, it may be appreciated that the engineers have not been remiss in thus devoting a great deal of time and attention to this portion of the car. The battery consists of 30 cells of 11-plate Ironclad Exide battery, arranged to be carried in four trays. Two trays are located in front and carry nine cells each and the other two trays, which carry six cells each are located at the rear, the arrangement having been adopted in order to distribute the weight as evenly as possible and provide a "balance" which would ensure easy riding and freedom from skidding. Incidentally, as the batteries are above the frame, they are easy of access, and as they are outside the body, the fumes which are given off during charging operations can have no bad effect on the upholstery. Similarly, the replenishment of the electrolyte does not endanger upholstery, and a further advantage of the battery arrangement is that the car doors may be locked when the vehicle is left for charging purposes at a public garage.

The front axle is of the I-beam type and has been given a very decided drop in order that the frame of the vehicle may be kept as low as possible. In this way stability is gained and no undue effort is required in stepping into or out of the car. The steering knuckles are of the reversed Elliott type, and for the sake of safety the tie rod has been placed behind the axle. The drag link has been placed above the axle for the same reason. In order to provide the lightest construction consistent with strength, the rear axle is of the semi-floating type with the flange which bolts to the wheels forged integral with the drive shaft. Throughout the car, ball bearings have been used wherever practicable, the example of the front wheel bearings being typical of the thought which has been expended in design. The load carrying bearings are so mounted as to come directly in the center plane of the wheels. At the outer ends of the hubs there are pilot bearings which carry practically no radial load but take all the thrust load; thus wear is reduced to a minimum.



STANDARD CHASSIS ARRANGEMENT

Although body improvements are extensive, and the materials which enter into the make-up of the car are of even better quality than they have been in the past, the price remains practically stationary. With standard equipment, which includes the usual complement of lamps, tire repair outfit, jack, tools, toilet articles and so forth, the coupe model lists at $1,885, which represents an increase of $35 over last year's price.

TONS OF FACTORY "WASTE" THAT IS CONVERTED INTO SUBSTANTIAL PROFIT

Enormous Quantities of Metal Shavings That Appear Worthless Purchased by Steel Mills and Returned to the Melting Pot—Electro Magnets That Assist the Separation of the Shavings—Ford Practice as an Apt Illustration.

To the unpracticed eye, the modern automobile factory where large numbers of completed cars are turned out each day well may appear a veritable monument to waste. Thousands of automatic machines busily engaged in delivering finished parts quickly cause piles of "scrap" and turnings and metal chips. In nearly every factory of any size it is the duty of a corps of men to do nothing but clear away this material, which apparently is worthless, in order that the machines may be kept up to the required efficiency. But that is not the only reason all such "waste" carefully is collected. It is all saved and sorted and melted down and made right back into ingots, and that which has been termed "waste" really is not waste at all. At the Ford factory in Detroit, Mich., for instance, where some 75,000 complete cars are turned out a year, and the amount of chips and turnings that accumulate under the many machines amounts to close to a ton a day, a number of men are employed to do nothing but collect and sort and pack up "waste."

Beneath each machine there is a metal pan into which all the borings or grindings or turnings drop. The pans fill very quickly under some of the machines, and the men must move quickly to keep them clear. All the "waste" is taken to a large room and spread out on benches where two men with large electro magnets employ themselves by drawing the magnets through it. Of course the iron and steel turnings cling to the magnets and the brass or bronze "waste" remains. The steel particles are dropped in waiting receptacles and then are baled and shipped off to the great steel mills in Pittsburgh, where they are melted down and cast into ingots for later conversion into bars and strips. Even a very small amount of brass scrap among the iron or steel shavings would play havoc when the remelting process was attempted, and for this reason great care is taken to see that none remains. The brass and bronze, of course, also is melted down and made into ingots for future use. The Ford factory, like most of the other large factories, remelts its own iron scrap, though the steel and brass is shipped back to the manufacturer for smelting. In the Ford factory alone, some 10 carloads of steel turnings and three carloads of iron borings accumulate each month, and it has been estimated that the "waste" from all the factories in Detroit, which is not "waste" at all, represents several millions of dollars a year, a fact which rarely fails to cause an expression of unfeigned surprise on the part of the unknowing visitor to a large plant.

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TWO PERFECT SCORES MARK BUFFALO TOUR

Eight of the Nine Starters Complete the Four-Day Contest—Rain and Steep Hills Make the Going Difficult.

Although not a few heartbreaking hills together with the usual complement of good, bad and indifferent roads were encountered before the 800 miles which constituted the four days' work for the nine contenders in the third annual reliability tour of the Automobile Club of Buffalo, which was inaugurated Wednesday, September 11th, had been reeled off, two of the contenders were able to surmount the difficulties without incurring penalty. They are Harry Holcomb and A. G. Shoenthal, who were at the wheels of a Warren and a Maxwell, respectively. The winners of the Laurens Enos and the Vars trophies, however, have not yet been announced, since a couple of minor points, which may change the final scores, have not yet been decided by the referee.

Unlike the majority of such contests, in which the contenders must needs put up at a different town each night, the night control always was the home city; the contenders started each morning and made a run to a noon control and returned, over a different route, however, during the afternoon. Grade 3 rules, by which penalties are incurred only for work done on the road and for lateness at the controls, prevailed.

The first day's trip was to Smithport, Pa., 105 miles from Buffalo, or a total of 210 miles for the day. Rain fell during the greater part of the morning, so that before the turning point was reached the roads were in poor condition. But three contenders were penalized for the day's work, G. Morton Wolf, who received 4 points for work done on the motor of his Maxwell; W. G. Schroeder (R. C. H.), 3 points for taking on water, and C. O. Almendinger (Hupmobile), 6 points for replacing fuel.

Thursday, 12th inst., another 210 miles were covered in the run to Jamestown, N. Y., and return, and three contenders received penalties. Schroeder lost 3 more points for replacing water, Win. Graham (McFarlan) lost 10 points when his car was ditched, and Bruce Malcolm 3 points for filling his gasolene tank.

Friday, 220 miles, to Canandaigua and return, were completed with penalties incurred only by Graham (McFarlan) for motor work, and Schroeder (R. C. H.) for filling the radiator.

Saturday's run led to North Java and return, a distance of 260 miles, through very mountainous country. But three contenders incurred penalties. Graham (McFarlan) was debited 150 points for motor work, Langham (Krit) 37 for like cause, and Barclay (Amplex) withdrew with a broken spring.

The total scores at the end of the contest were: Harry Holcomb (Warren-Detroit), 0; A. G. Schoenthal (Maxwell), 0; Bruce Malcolm (Paige-Detroit), 3; G. Morton Wolf (Maxwell), 4; C. O. Almendinger (Hupmobile), 6; W. G. Schroeder (R. C. H.), 9; Roy Langham (Krit), 37; Winfield Graham (McFarlan), 176; J. G. Barclay (Amplex), withdrawn.

TROPHY THAT ECLIPSES GLIDDEN



A. A. A. Cup which constitutes chief award for the National Reliability Tour and which will be first contested for next month.

Unauthorized Car Insurance Forbidden.

Insurance companies doing business in Ohio which write insurance for automobile owners against the loss of or damage to their machines when not authorized by their licenses have been warned by State Insurance Superintendent E. H. Moore that if they persist in this practice that their licenses will be immedaitely revoked without further warning.

In a letter of warning to insurance companies Superintendent Moore says that certain concerns try to dodge the law by insuring owners against the "loss of use or occupancy" of automobiles in stead of insuring against the loss of the machines themselves. This is a subterfuge which will not be tolerated, he says.

Attorney General Hogan has issued an opinion ruling that companies organized for insuring automobiles cannot be incorporated under the laws of Ohio.

J. B. Park was selected to head the Duluth (Minn.) Automobile Club at the annual election of officers. The other officers elected are: Vice-president, M. F. Rockwell; secretary, H. J. Mullen; treasurer, H. C. Nickolas.

CAUSES POSTPONEMENT OF GRAND PRIZE RACE

Condition of Course Such That Entrants Refuse to Start and Contest Goes Over to Monday—Vanderbilt Will Precede It.

Although proclamations and every-day statements, all lauding the condition of the Wauwatosa course over which are to be run the Vanderbilt and Grand Prize races, as well as the minor contests for the Pabst and Wisconsin trophies, were spread broadcast until it appeared that the course was not short of perfection itself, when those who are to compete in the events arrived at Milwaukee ready to try out the course, it was discovered that the statements were of the same variety as those which were made with regard to the coming of the three French Peugeot cars, i. e., without foundation.

So bad were the roads and so little had been done toward putting them in any kind or shape at all, that the intending contenders practically forced a postponement of the Grand Prize race, which was to have been run on Tuesday last, 17th inst., until Monday next, 23rd inst.; the other three events which go to make up Milwaukee's speed carnival will be run according to schedule, the smaller races tomorrow, 20th inst., and the Vanderbilt Cup race on Saturday, 21st.

In the meantime a large corps of workmen has been at work seeking to better the condition of the roads, but as the work will not have time to settle, it will not be any too good when the race does occur.

The list of those who will compete in the Grand Prize race, for which the entries closed on Tuesday last, has been augmented by the names of George Clark, who as usual will pilot a Mercedes car, and Spencer Wishart, who will be at the wheel of a Mercer. In view of the fact that Joe Dawson has not yet been reinstated by the contest board of the A. A. A., at such a late date the possibilities of his being again placed on the "good list" in time to compete at Milwaukee are but slight. Joe Horan has been nominated to pilot the Benz car which was to have been driven by the winner of the Indianapolis Sweepstakes. Those who will compete in the Grand Prize are: Hughie Hughes (Mercer), Ralph DePalma (Mercedes), Theodore Tetzlaff (Fiat), David Bruce-Brown (Fiat), Caleb Bragg (Fiat), Erwin Bergdoll (Benz), Robert Burman (Benz), George Clark (Mercedes), Joe Horan (Benz), Spencer Wishart (Mercer), H. Nelson (Lozier).

Entries for the Vanderbilt Cup race will close tomorrow night, 19th inst. The en-

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trants named to date are: Charles Merz (Stutz), Gil Anderson (Stutz), Ralph De Palma (Mercedes), Spencer Wishart (Mercer), George Clark (Mercedes), Ralph Mulford (Knox), Hughie Hughes (Mercer), Theodore Tetzlaff (Fiat), Harry Nelson (Lozier), N. Pullen (Mercer). For the Pabst trophy seven entrants have been named. They are: Hughie Hughes (Mercer), Neil Pullen (Mercer), Spencer Wishart (Mercer), G. Trussell (Fal), H. Hastings (Fal), Mort. Roberts (Mason), Joe Nikrent (Case). But four have been named to compete for the Wisconsin trophy, as follows: H. Herber (Studebaker 30), Harry Endicott (Mason), Kramer (Mason), Snyder (Mason), Kulik (Ford).

Two Spills Mar Indiana Racemeet.

Three accidents, two of which were serious, marred the racemeet on the Lawrenceburg (Ind.) half-mile track Saturday last, 14th inst., which was promoted by the Tri-state Racing Association. The first mishap occurred before the start of the contests, when a Matheson driven by Forest Stevens skidded, turned turtle and pinned the driver to the earth. Stevens was severely cut and badly shaken up. Dust blinded Thomas Terry as he was piloting his Studebaker around one of the turns in the first event, so that he collided with Robert Oberting (Ford), putting both cars out of the running but causing no injury to either pilot. Terry was not so fortunate when, during the last event, dust again interfered with his control of a second Studebaker car and he went through the fence, sustaining internal injuries which necessitated his removal to the hospital.

J. Oberting, driving a Nyberg car, took the honors of the day when he won a ten-mile event, which he completed in 13:57, and a five-mile event, in which he brought his mount home in 6:56¼, leading six other contenders. Graff, driving a Studebaker 20, won the five-mile event for roadsters in 7:30; a three-mile race for touring cars carrying four passengers went to Bishoff, driving an Overland, who completed the course in 4:50. The five-mile event, which completed the program, went to Dixon (Mercer), who crossed the tape in 6:58. The summary:

Five miles, for a purse of $100—Won by Graff (Studebaker 20); second, J. Oberting (Studebaker 30); third, McCord (Empire). Time, 7:30.

Five miles, for a purse of $100—Won by Dixon (Mercer); second, Britt (Oakland); third, Oberting (Studebaker 30). Time, 6:58.

Three miles, for touring cars carrying four passengers, purse $75—Won by Bishoff (Overland); second, Terry (Studebaker 30). Time, 4:50.

Ten miles, for a purse of $150—Won by Oberting (Nyberg); second, Dixon (Mercer); third, Swift (Schacht). Time, 13:57.

Five miles, for a purse of $100—Won by Oberting (Nyberg); second, Dixon (Mercer); third, Swift (Schacht). Time, 6:56¼.

THREE SHARE HONORS IN CLEVELAND MEET

Oldfield, Evans and Endicott Play the Leading Parts—Disbrow Turns a Mile in the Fast Time of 49.35 Seconds.

Honors at the Cleveland Automobile Club's race meet which was run on the North Randall track, Saturday, 14th inst., were pretty well divided between Barney Oldfield, William Evans and William Endicott. Each of the trio succeeded in "landing" two of the eight events which composed the day's program. The other two events were won by Mallory (Hupmobile), who completed the ten-mile event, which was open only to local drivers, in 12:00.08, leading home Snyder (Metz) and Louis Disbrow, who made the fastest time in the single mile time trials, covering the distance in the Simplex in 49.35 seconds as against 49.93 seconds, Oldfield's (Christie) best time.

The five-mile free-for-all handicap proved by far the most interesting event. Seven drivers contended. Evans (Studebaker) assumed the lead early and never was headed. He finished the distance in 4:59, just a second ahead of Heineman (Cino), who was fast gaining on the winner. Third place went to Nikrent in a Case. Evans also won a five-mile Class C event for cars with displacements of under 231 inches, which he finished in 5:28.20. Oldfield's victories included a five-mile Class C event for cars with displacements of 231-300 inches, which he completed, driving a Cino, in 4:54.65, leading home Nikrent (Case) and Disbrow (Case), and a five-mile Class E event, for cars with displacements of under 600 inches, which he negotiated in 4:44.99. Endicott, who piloted a Case car, took the Australian pursuit. The summary:

Five miles, for cars with displacements of under 231 inches—Won by Evans (Studebaker 20); second, Mallory (Hupmobile); third, Snyder (Metz). Time, 5:28.20.

Five miles, for cars with displacements of 231-300 inches—Won by Oldfield (Cino); second, Nikrent (Case); third, Disbrow (Case). Time, 4:54.65.

Three miles, for cars with displacements of under 600 inches—Won by Endicott (Case); second, Oldfield (Benz); third, Hauserman (Benton). Time, 3:05.99.

Five miles, for cars with displacements of under 600 inches—Won by Oldfield (Benz); second, Heineman (Cino); third, Nikrent (Case); fourth, Disbrow (Simplex); fifth, Endicott (Case). Time, 4:44.99.

Ten miles, for Cleveland cars—Won by Mallory (Hupmobile); second, Snyder (Metz). Time, 12:00.08.

Ten miles, Australian pursuit—Won by Endicott (Case); second, Heineman (Cino); third, Ulbrecht (Case); fourth, Nikrent (Case). Time, 9:15.

Five miles, free-for-all handicap—Won by Evans (Studebaker 20); second, Heineman (Cino); third, Nikrent (Case); fourth, Endicott, (Case). Time, 4:59.

One mile, time trials—Disbrow (Simplex). Time, 0:49.35. Oldfield (Christie). Time, 0:49.93. Disbrow (Jay-Eye-See). Time, 0:52.58.

Burman Sweeps Clean at Sandusky.

Each of the four events which formed the program of the E. A. Moross meet on the half-mile track on the Fair Grounds, Sandusky, Ohio, Friday last, 13th inst., was a Burman event from start to finish. The only other contenders, Harvey Ringler, who piloted a Mercer, and Joe Horan, who handled a Mercedes, but they were outclassed and never had a chance. Burman's victories comprised two five-mile Class E events, which he completed in 7:45 and 6:39, respectively, both of the three-mile heats, which were run for the Remy Brassard and trophy, and which he completed in 4:06½ and 3:48, respectively, and a single mile time trial, which he negotiated in 1:08. The summary:

Five miles, for cars with displacements of under 600 inches—Won by Robert Burman (Cutting); second, Harvey Ringler (Mercer). Time, 7:45.

One mile, time trial—Robert Burman (Benz). Time, 1:08.

Three miles, for the Remy Brassard and trophy—First heat won by Robert Burman (Ohio); second, Joe Horan (Mercedes); third, Harvey Ringler (Mercer). Time, 4:06½. Second heat won by Robert Burman (Ohio); second, Harvey Ringler (Mercer); third, Joe Horan (Mercedes). Time, 3:48.

Five miles, for cars with displacements of under 600 inches—Won by Robert Burman (Cutting); second, Harvey Ringler (Mercer). Time, 6:39.

Colors Designate New York State Roads.

Suggestions advanced by Frank D. Lyon, secretary of the New York State Automobile Association, have been adopted by Superintendent Reel, of the New York State Highway Department, who last week placed his approval upon Lyon's scheme of marking the main state highways for the guidance of motorists. The roads are to be made easily recognizable by having the fences and bridge approaches painted certain colors. The colors and routes are: Blue—New York to Buffalo via Albany and Syracuse; Red—New York to Jamestown via Binghamton; Yellow—New York to Canadian border at Ogdensburg and return, through Adirondacks going, through Watertown returning; Green—Binghamton to Niagara Falls through Albany, Rouses Point, Ogdensburg and Oswego; Brown—Oswego to Binghamton via Syracuse and Cortland.

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The Slanguage of The Chauffeur

Every trade or profession has its dialect or vocabulary of terms, which may or may not be called "slang," and of course the automobile business has developed a young dictionary of words and phrases which are in some respects a language all by themselves. Probably every reader of The Motor World is familiar with the most general of the so-called "slang" words, but there doubtless are various provincialisms which would be little understood outside the localities where they have grown up. Perhaps, too, some of the more genteel of the throttle-twisting profession are unfamiliar with the street chauffeur's dialect because of their unwillingness to descend to the slangy level which seems to be an altitude which is more or less automatically reached by many of those "gas" pilots who thread their ways through a city's traffic.

One writer connected with a daily newspaper has undertaken to address his readers with a dissertation on chauffeur talk, and while some of the sayings may be provincialisms, most of them really are in more or less common use. "When the chauffeur says, 'Step on her tail,'" said the writer, "he means 'to take it on the loop,' which, of course, is to 'give her the juice,' or, in other words, to make the car bound over the road. Occasionally he varies these by telling that he 'gave her a kick,' the general idea being that he made use of the accelerator in order to hurry the car along. If he says he 'tickled the motor' he does not necessarily mean that he went around with a feather trying to excite the risibilities of any part of the machinery, but simply that he 'jiggled' a part of the carburetter in order to get a little flow of gas into the cylinders preparatory to 'spinning her.'

"By 'spinning' of course he meant the operation of cranking the motor. The chauffeur never 'cranks' a motor. He either 'turns her over' or 'spins her.' With the growing use of the self-starter or self-cranking devices he will probably have to adopt a new system of describing this operation.

"An automobile, by the way, is rarely a car or a machine, but usually a 'boat.' 'Boat,' however, is not as recent or in as good form as 'boiler.' 'Boiler' is no heritage necessarily from the days of steam cars, but it applies very well to a few of them which get overheated. A chauffeur does not speak of the fuel he uses as gasolene or—as some folks who are not very well acquainted with automobiles say—'oil.' The stuff he uses is always 'gas,' so that he has no distinctive phrase for acetylene, which is used in some headlighting systems. When a chauffeur says 'oil' he means lubricating oil.

"The chauffeur has his own set of dislikes, which generally begins with his employer and includes his car and all the appointments on it. However, in the presence of other chauffeurs he is more than likely to defend the particular 'boat' he is handling, and of course if it happens to be a fairly large sized machine he describes anything else smaller than it as a 'road louse.' That is particularly the phrase for a taxicab. There are some small touring cars which scuttle about the roads to which this name always is applied.

"'A bunch of junk' is undoubtedly originally a chauffeur's phrase for describing a car which he did not like, perhaps because he could not get his commission from the dealer for inducing his employer to buy one. It is to be understood that 'bunch of junk' is not an entirely severe condemnation, because that phrase is applied to any car of which he does not even in the least particular approve.

"When a battery is weak the proper procedure is to 'put her on the mag,' which is a more or less logical abbreviation of magneto. If the driver of a four-cylinder car fails to get his motor to fire on the normal complement of cylinders he describes it as 'hitting on three' or 'two,' as the case may be. Sometimes he may be 'hitting only on one,' but that condition can't keep up for long. The car, which is normally equipped with but one cylinder, of which there are so few nowadays, was long ago christened the 'one lunger.' When a car fails to yield its full power or stops it 'dies.' Similarly to stall a motor is to 'kill it.'

"But in the main the slang of the chauffeur is the slang of the street. He has not the inventive genius to build up new sets of phrases for describing things and in the few respects where operations are peculiarly those of self-propelled motor vehicles he is apt to borrow from semi-technical language and let it go at that."

Fruit Man Has Synthetic Rubber Scheme.

Apparently the dreams of the synthetic rubber producer—which may not be dreams after all—have reached even to the fruit farms in the state of Washington. At least one fruit farmer, T. S. Kennerly, who hails from North Yakima, where he recently put in operation an immense fruit distilling plant, has a project in mind whereby the ultimate cost of tires and other rubber commodities may be brought down considerably. The process by which Kennerly proposes to produce his rubber is his own invention. He contemplates the separation of fusel oil from fruit brandies during the process of distillation. Afterward the fusel oil will be treated successively with hydrochloric acid, chlorine and soda lime and then will be solidified by being placed in contact with metallic sodium. According to his own calculations, his synthetic rubber can be made to sell for 60 cents a pound, whereas at the present market value, Para sells for approximately $1.20 a pound.

The Hydrometer and the 33% Salesman

Her car had been cutting capers for some time and, among other things, had developed a voracious appetite for gasolene, a fact which did not add to her peace of mind. Many times the chauffeur had blamed the gasolene and, having heard from other sources that the quality of the fuel dispensed at garages had sadly deteriorated, she determined to satisfy herself.

She had been told that a hydrometer was the proper instrument with which to test the gasolene. She had no idea what one looked like, but her chauffeur was sympathetic and when the quest was undertaken he led the way to one of those 33 1/3 per cent. automobile supply houses, the bargain-like title of which constitutes an allurement for womankind. When the hydrometer was passed over the counter and the price paid for it, her ladyship, true to her sex, asked, "Are you sure it is all right?"

"Oh, yes, madam," replied the salesman. "these instruments are tested by the United States government."

"And what does Beaume mean?" inquired the lady as she indicated the name which appears on the thermometer-like scale.

"That," exclaimed the 33 1/3 per cent. salesman, "Oh, that marks the point at which gasolene separates from water."

This may sound like a fairy tale, but it isn't; its gospel truth.

Incidentally, the salesman, several days later, was glad enough to refund, without so much as a word of protest, the price of the instrument which had been "tested by the United States government." The lady had grown wise meanwhile, and there was no misunderstanding what she said or the way she said it.

Mysterious Water in Carburetter.

Mysterious cases of trouble from water in the carburetter sometimes occur, even when there is a separator in the gasolene line that ought to retain all water. The explanation is that the moisture in the air taken in through the carburetter is condensed on the walls of the mixing chamber, and drips down and causes trouble, even to the extent of freezing in cold weather. The condensing action is greatly intensified by the cooling attendant upon the evaporation of the gasolene, which not infrequently produces a coating of frost on the outside of the intake pipe just above the carburetter. It is just as natural for the moisture of the air to collect inside the pipe as it is for the moisture to collect outside. The moral is that water in the carburetter does not necessarily indicate water in the gasolene, especially if there is a separator in the line.

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1,015,700. Vehicle Wheel. Arthur Mosso, Sonoma, and Pietro Giovanetti, San Francisco, Cal. Filed June 26, 1911. Serial No. 635,350.

The combination in a vehicle wheel, of an annular cushion, an annular, continuous, concaved armor embracing said cushion, means connecting said armor and the wheel so that the former will move circumferentially, independently of the wheel and cushion, said means including a ring mounted for circumferential movement upon each side of the wheel, yokes attached to the wheel and embracing the inner edges of the rings for holding the rings against vertical displacement and concentric with the axis of the wheel, and compensating connections between the edges of the armor.

1,016,251. Carbureter. James M. Dayton, Torrington, Conn., assignor to Excelsior Needle Company, Torrington, Conn., a Corporation of Connecticut. Filed Nov. 2, 1909. Serial No. 525,942. (Cl. 48—155.1.)

1. A carbureter including in combination a main casing having an air passage therethrough, a downwardly projecting sleeve carried by said main casing having an opening extending centrally through the sleeve, a float chamber surrounding said sleeve, a valve for controlling the fuel supplied to the float chamber, said valve having a stem sliding in the opening in said sleeve, a fuel-delivering nozzle directly above said sleeve and projecting into said air passage, said sleeve having an opening leading from the central opening to the float chamber, and a needle valve for controlling the supply from said nozzle.

1,016,298. Spring Wheel. Louis P. Sievers, Larchwood, Iowa. Filed June 1, 1911. Serial No. 630,622. (Cl. 152—28.)

In a spring wheel the combination with a hub having spokes radiating therefrom, a rim supported and spaced from the hub by said spokes, a pair of parallel rows of openings formed in said rim and being arranged in staggered relation, a pair of members having radial arms provided with oppositely disposed ears, inner rims formed integral with the outer ends of said arms, outwardly projecting lugs formed upon the outer face of the inner rims and being arranged in staggered relation, plugs slidably mounted in the openings formed in the outer rim and positioned directly over the lugs upon the inner rims, said plugs being provided with flanges, coil springs placed between said rims and having their upper terminals resting against said flanges and their lower terminals resting against the inner rims, said springs being held against accidental displacement by the lugs, and means passing through the oppositely disposed ears for clamping the pair of members to certain of the spokes.

1,016,326. Resilient Cushion for Rear Axles. Jew Garlick, Paterson, N. J., assignor of one-half to Harry U. Garlick, Paterson, N. J. Filed Jan. 25, 1910. Serial No. 540,007. (Cl. 21—50.)

The combination with a vehicle axle and a vehicle frame, of a horizontal cylinder disposed above, and parallel to the axle, the cylinder being of sufficient length to extend entirely across the vehicle; means upon the ends of the cylinder for engaging opposite side members of the frame; the cylinder having spaced, depending sleeves; standards mounted to slide in the sleeves and having heads disposed within the cylinder, transversely of the same, the heads being concavo-convex, to conform to the inner surface of the cylinder; means for connecting the standards with the axle; an inflatable bag in the cylinder, and fitting in the concaved heads; the cylinder having a substantially vertical opening in its side, through which the bag may be inserted, from one end of the vehicle; and a closure for the opening, the closure being freely removable, without disturbing the connections between the cylinder, the axle and the frame.

1,016,335. Internal Combustion Engine. Alvaro S. Krotz, Chicago, Ill. Filed Feb. 19, 1910. Serial No. 544,849. (Cl. 123—139.)

1. A combined fuel and air feeding pump for internal combustion engines comprising, a primary and secondary piston connected for simultaneous reciprocation, a pump casing formed with primary and secondary piston chambers for said pistons, an air supply pipe having connection with the outlet passage from the secondary piston chamber and with the inlet passage to the primary piston chamber, a liquid fuel pipe connected with the inlet port of the secondary piston chamber, and an outlet casing having connection with the outlet port of the primary piston chamber and with the explosion chamber of the engine, and means for imparting reciprocation to said pistons, substantially as set forth.

1,016,349. Patch for Pneumatic Tires. Clarke W. McKee, San Diego, Cal. Filed March 9, 1911. Serial No. 613,219. (Cl. 152—26.)

A patch for pneumatic tires comprising a band of practically non-elastic material tapered toward the one end, the other end thereof being provided with a short flap adapted for lacing and another flap similarly adapted and of sufficient length when used in connection with said short flap to reach around the inner inflated tube, and means for lacing the two edges of the said flaps together, all substantially as set forth.

1,016,404. Direction Indicator for Vehicles. Christopher O'Neill Crowley and Henry Alfred Lamb, London, England. Filed March 1, 1910. Serial No. 546,720. (Cl. 116—31.)

Apparatus for indicating variations in the movement of a vehicle, comprising, in combination, a casing having an aperture, vertical guides fitted within the casing, a plurality of indicating devices wholly contained within the casing, pivoted levers for moving said indicating devices independently in said guides into the same indicating position opposite the aperture, springs connected to said pivoted levers and to the casing, flexible means connected to said pivoted levers, stops on said flexible means, a rock shaft, lever devices secured to said rock shaft and adapted to be operated by said stops, and bell operating mechanism in operative relation with said lever devices.

1,016,418. Pneumatic Suspension for Vehicles. William Kneen, London, England. Filed July 9, 1910. Serial No. 571,193. (Cl. 21—50.)

1. A vehicle including an axle, a spring, a casing suspended under said axle by means of clips and clip bolts, an air containing cushion in said casing, a vertically reciprocable cover on said cushion and having a guide for said axle secured thereon, said guide constituting a support for said spring, an arm secured to said guide and pivoted to said axle, one of said clips having an upwardly bent portion for allowing relative movement of said arm.

1,016,427. Clutch for Automobiles and the Like. Alfred B. Morse, South Easton, Mass. Filed Nov. 16, 1909. Serial No. 528,348. (Cl. 192—10.)

1. In a clutch of the kind described, coöperating clutch members, actuating means for bringing said members together in clutched relation, means for relatively adjusting said actuating means with reference to the clutch members, a casing for the aforesaid mechanism, external operating means for the internal actuating means, and separate external operating means for said internal adjusting means, said two operating means having connections to the actuating and adjusting means respectively extending with a close bearing fit through the casing.

1,016,472. Tire. Tracy V. Buckwalter, Altoona, Pa. Filed April 29, 1910. Serial No. 558,436. (Cl. 152—1.)

A tire comprising a resilient body and an open-work reinforcing metal band embedded therein, said band comprising a wire hoop and a plurality of cross wires of smaller gage welded exteriorly to the hoop substantially as described for the purpose set forth.

1,016,534. Spring Wheel. Harmon E. Wirebaugh, Canton, Ohio. Filed Oct. 24, 1910. Serial No. 588,610. (Cl. 152—47.)

1. A spring wheel comprising a hub, two spaced hub plates concentrically connected to said hub, said plates provided adjacent their circumferential edges with screw threaded spoke attaching apertures, screw threaded bushings arranged in said spoke attaching apertures and having screw threaded projecting portions extending beyond the outer limits of said spoke attaching apertures, spoke blocks arranged intermediate the hub plates, each spoke block provided with oppositely disposed, aligned studs mounted in the bushings of oppositely disposed spoke attaching apertures, said blocks being adapted to oscillate with reference to said hub plates, said spoke blocks provided with radially disposed spoke apertures, the inner ends of said spokes extending beyond said spoke blocks toward said hub, said spoke blocks also provided with inner annular recesses opening from said spoke apertures, dust washers arranged in said recesses and adapted to slidably engage said spokes, the outer end of each spoke block provided with a cap adjustably connected to said block, a dust washer held in place against the spoke by said cap, dust caps arranged on said screw threaded projecting portions of said bushings, one of said caps for each spoke block provided with a grease cup, the stud of said spoke block provided with a grease conducting channel extending to the spoke aperture in said spoke block and providing communication between said spoke aperture and said grease cup, wear plates concentrically arranged upon the inner sides of said hub plates between said hub and said spoke blocks, a coiled compression spring arranged upon each spoke between its spoke block and its inner end, spring caps arranged on said spoke, each cap having an annular spring retaining flange, head blocks arranged upon the inner ends of said spokes, means for adjusting said head blocks with reference to said spokes, said head blocks provided with cups, steel balls in said cups adapted to engage said wear plates, a felly and rim, and said spokes pivotally connected at their outer ends to said felly.

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They are being built in larger quantities. And then, remember, that you are dealing with an organization that is capitalized at $50,000,000, and dates back to 1835 as movers of the world's goods.

Write and learn our proposition.

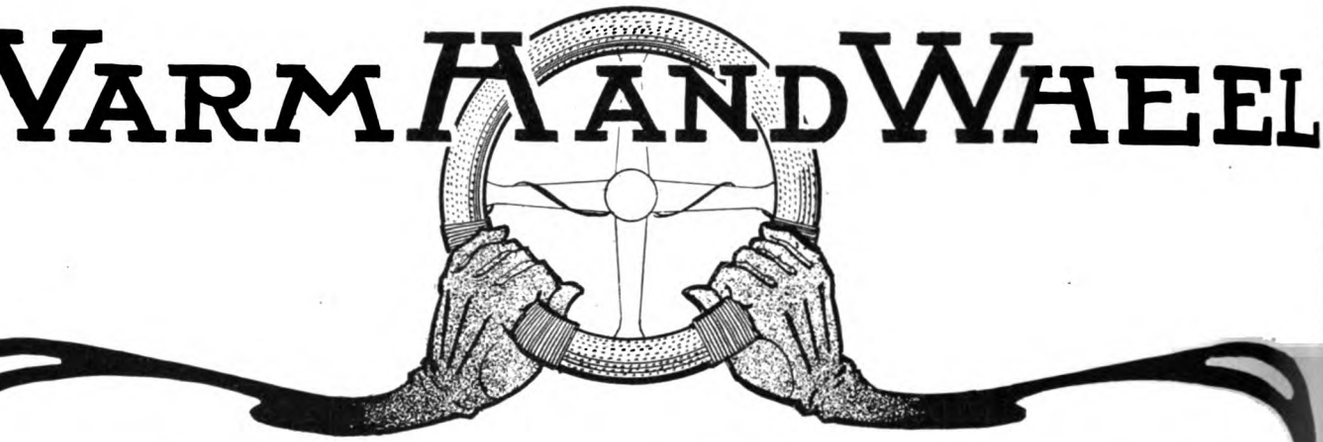
Harry S. Houpt
General Sales Manager

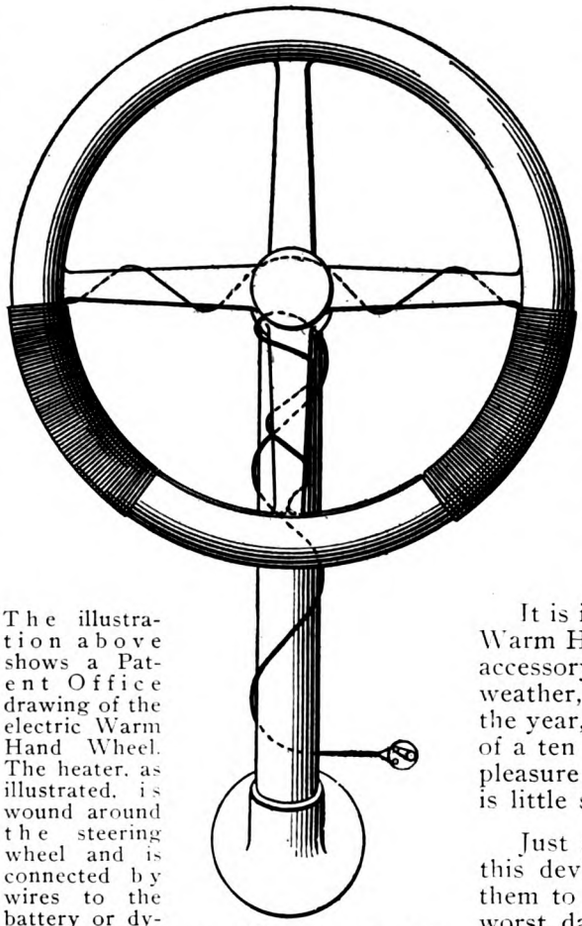
AMERICAN LOCOMOTIVE COMPANY, 1906 Broadway, New York City Builders of Alco Motor Trucks, Alco Motor Cars, Alco Taxicabs
Movers of the World's Goods Since 1835. Capital $50,000,000.

September 1, 1912

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WARM HAND WHEEL





The illustration above shows a Patent Office drawing of the electric Warm Hand Wheel. The heater, as illustrated, is wound around the steering wheel and is connected by wires to the battery or dynamo of your car. The current consumption is very small and yet the device will keep your hands as warm in winter as in summer. This system is adaptable especially to Ford cars.



In addition to the Warm Hand Wheel we also manufacture a similar heater which may be attached to the foot rail in the tonneau. This foot rail attachment sells for $7.50.

WE ARE GOING TO BE REPRESENTED IN YOUR TERRITORY

ARE YOU THE MAN WE WANT?

Ability and Willingness to Push the Livest Accessory in the Automobile Field Are the Principal Requirements We Demand.

What we need now more than anything else are men to sell our product. There can be no question that the Warm Hand Wheel is the most practical accessory in the automobile industry and there is no question but that the simple showing of it to the automobile public will sell countless thousands of our electric Warm Hand Wheel.

It is impossible to conceive of a device with the merits of the Warm Hand Wheel that will not sell on sight—for it is the only accessory on the market that makes driving during the cold weather, which most of us encounter during six months of the year, safe and comfortable. In other words, the expenditure of a ten dollar bill by any one of your customers will give real pleasure to his driving an automobile where now such driving is little short of absolute suffering.

Just stop and think to how many customers you could sell this device if you would simply tell them that it will enable them to drive bare handed or with light kid gloves during the worst day in winter and do it just as comfortably as if they were driving now. Do you think you will have any trouble in selling them on that basis?

As we said before, there is no question about our having the commodity. All we need now is YOU. Don't wait until winter comes before getting in touch with us and find out all about this proposition. Do that today—you don't have to buy until you are ready. At least be informed on what we really have to offer. Send for our booklet and discounts.

The Warm Hand Steering Wheel Company 527 Fifth Ave. NEW YORK

Patented April 23, 1907
Patented Feb. 11, 1908
Patented April 2, 1912
} Other patents pending.

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Well, I Got The Darned Thing Started

Did you ever hear that expression before?

Did you ever miss a train or an appointment because it took too long to start your car?

Lots of people have. And many of them have equipped their cars with Electric Self Crankers and been made happy. And then added an Electric Lighting Generator with GLBA Battery and were more happy.

You can make automobiling a real pleasure by doing the same. But, look at the Battery and

Be Sure It's An

GLBA

USE THE CLASS B GLBA BATTERY WITH AN ELECTRIC SELF STARTER

USE THE CLASS A GLBA BATTERY WITH AN ELECTRIC LIGHTING GENERATOR

Write us for full information

WILLARD STORAGE BATTERY CO.

CLEVELAND, OHIO

New York Branch, 136 W. 52d Street **Chicago Branch, 436 S. Dearborn Street**
Detroit Branch, 1191 Woodward Avenue

Depots in all principal cities in the United States, Canada and Mexico

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"The Horn that's Made for the Discriminating"

TUTO HORN

THE TWO TONE HORN

Not Competitive.

WHEN the TUTO horn is installed as standard equipment on your car it represents the only electrical warning device that does all of the signalling—both low and loud—as this feature is covered by our exclusive United States and Foreign patents.

¶ Therefore, the TUTO horn is non-competitive, from an operating and sales stand-point.

¶ No excuses are necessary to your customers, as the TUTO horn is the only complete electrical warning device procurable.

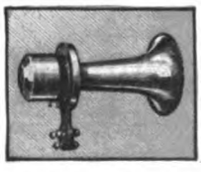
¶ Its low note replaces the bulb horn and is effective fully 90% of the time.

¶ The loud note is instantly produced by merely increasing the pressure on the same button used in sounding the milder signal.

¶ There is no confusion or duplication of signalling devices.

¶ The TUTO is most reliable, neat and effective, and the design and finish are of such a high character as to be in full keeping with the most refined and highest grade cars made.

¶ The TUTO horn has no competition, therefore, it is best for standard equipment.

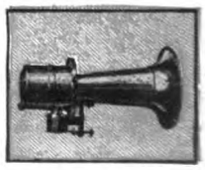


TUTO Horn, $25.00

The Dean Electric Co.

260 Taylor Avenue, Elyria, Ohio

"Look for Dean where Quality's seen"



TUTO-ETTE $17.50

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A New Atwater Kent Ignition System WITH Automatic Spark Advance

This new system, known as the Type K, is noiseless and ncludes a method of automatically controlling the timing of :he spark at any speed from three to seventy miles per hour.

The Type K System is practically silent—much more quiet than a magneto, and gives very much better results. Its efficiency, due to the construction of the contact maker and to the automatic advance, is higher than that of any other ignition device made.

The perfection of this automatic feature s the result of three years of hard engineering work to bring it to its present state of perfection, and we consider it the greatest step in ignition that has been made in several years.



For the last seven years, the Atwater Kent System has held its place as being unquestionably the best battery system in the world. During this time over **seventy-five thousand of our systems have been sold,** and practically all of them are in use to-day. They have not been sold because we coaxed people to buy them, but because one system has sold another.

During the period of the magneto fad, thousands of our friends who formerly used our system and *knew* what it *was*, discarded the magnetos on their new cars and put on the Atwater Kent, claiming they got much better results with much less trouble.

Our manufacturing facilities and reputation have been such that we could have taken advantage of the magneto craze and manufactured magnetos. We could, undoubtedly, have sold large quantities of them, but we knew that our system was better than any magneto that could be built and so stuck to it As a consequence we know more to-day about battery ignition than any other manufacturer.

During the seven years that we have been manufacturing our system we have acknowledged that the magneto had the advantage of us on only one point—it generates its own current and therefore needs no battery, but to-day with the general adoption of electric lighting and therefore a plentiful supply of current from a dependable source which is available for ignition as well, what advantage has the magneto over our system? **Absolutely none!**—and on the other hand, **the Atwater Kent System has many over the magneto.**

This new Type K System has been our pet for over three years. Our whole engineering force has been working on it, making one model after another, perfecting, simplifying, cutting down cost of manufacture, and but few have known that we were working on it.

During the past year we have had our entire tool force making tools, fixtures, and machinery for producing this Type K in quantities. We have refrained from making any announcement until we had our factory in such shape that we could make prompt deliveries, realizing that it was useless to announce a good thing until we could give the public prompt delivery and satisfy the unquestionable demand.

The most wonderful feature of the new Type K System is the automatic spark control. A moment's thought will show that the setting of the spark should not be left to the discretion of the operator—at best, he can only guess the proper timing and even if he knew this definitely, he could not constantly shift his sparking lever to get the full efficiency of his motor at all speeds.

Our automatic spark control is really a self advancer and self-retarder. It begins to operate when the car is running at three miles an hour on the high gear and keeps the spark at precisely the proper position at the highest speed the car can possibly run. Below three miles an hour, the spark is at its proper position so that even though it were possible to run the car on high gear at two miles an hour or one-half mile an hour, the spark would always be correct. In the starting position the spark is properly retarded.

Another feature of the Type K System is that the primary circuit is not grounded, the contact maker being thoroughly insulated from the rest of the mechanism. This is of special value when the ignition current is taken from the lighting circuit.

One glance at the Type K will convince you of its unquestionable superiority in workmanship and of its simplicity and sureness of operation. Every manufacturing detail that enters into this system is as near automatic as possible, so that all parts are interchangeable and absolutely perfect.

Write to-day for further information, prices, etc.

ATWATER-KENT MFG. WORKS, 4937 Stenton Ave., Germantown, Pa.

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Remember—1913 Detroit-Abbott advertising will be printed in serial form, appearing regularly in the well known trade papers, also in the Saturday Evening Post, Collier's, Literary Digest and Life.

Abbott

All Models
Electric Self-Starter

Abbott-Detroit Power Plants

IN motor car manufacturing, there are so many opportunities for the substitution of inferior material and workmanship, so many ways that a high-grade construction may be imitated at a much less cost, that it behooves the dealer to demand specifications of sufficient minuteness to enable him to become thoroughly acquainted with the structural parts of the car.

It is for this reason that we are describing the construction of Abbott-Detroit cars in such an exact and detailed manner; feeling that a thorough acquaintance with their many points of superiority will entirely justify our statements that Abbott-Detroit cars are cars of quality, "Built for Permanence" and consistently "Guaranteed for Life."

CONTINENTAL MOTORS.

The motors used in Abbott-Detroit cars are the latest, long stroke type, manufactured under our personal supervision by the Continental Motor Manufacturing Company, acknowledged to be the best designers and builders of automobile engines in business today.

If you will compare the refined simplicity of these Abbott-Detroit motors with those of power plants in higher-priced cars, you will find that in every particular they are up-to-date, as well designed and as well finished as those in cars costing three times as much; and beyond doubt, the quietest running. They have large enclosed valves, inlet and exhaust pipes of simple direct form, allowing a free passage of gas in and out of the combustion chamber.

LARGE CYLINDERS.

The cylinders of the 44-50 are cast in pairs and have a bore of 4½" and a stroke of 5½".

The cylinders of the 34-40 are cast enbloc and have a bore of 4⅛" and a stroke of 5¼".

SPECIAL IRON USED.

They are made of a special grade of reverberatory air furnace iron, very uniform in structure. This iron has a tensile strength of 30,000 pounds, whereas that of the ordinary iron used in cylinders has a tensile strength of about 16,000 pounds—note this difference.

The two weakest points in cylinder construction—the cylinder head and the base flange—receive careful attention and are unusually strong.

Some motor car builders try to save money by making these parts light.

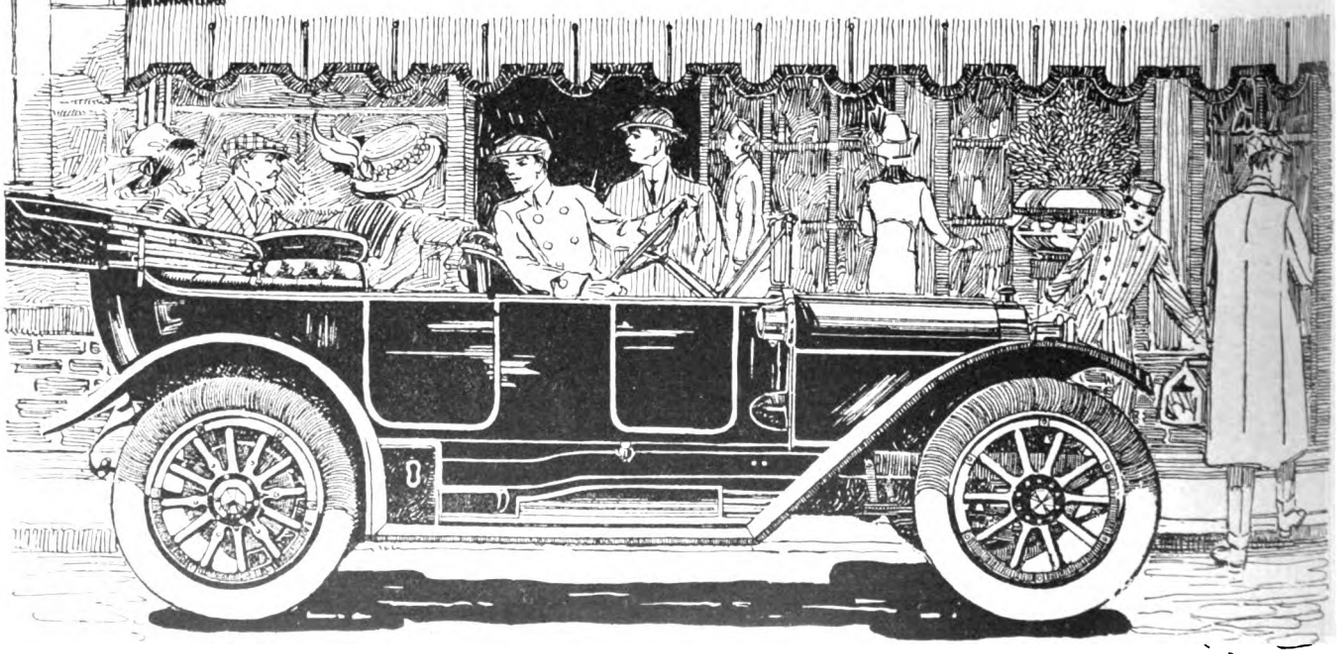
Every cylinder water jacket is tested under a hydrostatic pressure of 60 pounds after it had been machined, in order to make sure that there is no leakage or defect in the material.

ALUMINUM CRANK CASES.

The crank cases are made of the very best grade of nickel aluminum alloy having a tensile strength of 20,000 pounds per square inch; considerably more than that of the ordinary aluminum alloy used. Some manufacturers, in order to save money, make these cases of cast iron and paint them with a so-called aluminum paint which gives them much the same appearance as an aluminum casting.

While this is much cheaper from the manufacturer's standpoint, it is far from desirable, because cast iron is approximately three times heavier than aluminum and, furthermore, is not as ductile; and it is far more liable to crack.

We bring out this point to again call your atten-



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Detroit

"The demand of the day is that an organization shall be judged by its product and not by what it claims for itself."

Electric Lighting Standard Equipment

ABBOTT-DETROIT ELECTRIC SELF-STARTER

All 1913 Abbott-Detroit cars are equipped with our own specially designed, self-contained electric self-starter, Connected to crankshaft with independent train of gears. When gasoline motor starts, over-running clutch releases gears and they remain idle while gasoline motor is running.

Not an experiment—not an attempted combination of ignition, lighting and starting, but a real, dependable one, built as a part of the engine, included as regular equipment.

Visit our Sales rooms and have its operation explained.

tion to the ways in which competitive concerns seek to meet our prices at the expense of quality and the owner's subsequent discomfort.

ACCESSIBILITY.

For the sake of accessibility, so that the main bearings and connecting rod bearings may be easily examined or adjusted, we divide the crank case into two parts, the upper carrying the crankshaft bearings and the lower forming an oil reservoir.

Some competing makers use a less costly design known as the barrel type, a very impractical form which makes bearing adjustment difficult; it being necessary to tear down the complete motor in order to accomplish this object.

VALVES.

A great deal of attention has been given to the design of valves. Both the inlet and exhaust valves are interchangeable.

They have nickel steel heads and electrically welded carbon steel stems.

The reason for this is that we have found that ordinary carbon steel is not suitable for the valve head on account of "pittings" which, of course, produce badly seating valves and consequent loss of horsepower.

The valve push rods are of chrome nickel steel, which for hardened purposes is much better than any of the other kinds used. The surface does not wear easily.

All the moving parts are covered by removable metal plates, which not only keep the interior free from dust, but make the motor run more quietly.

Inasmuch as many motor troubles arise from faulty valves, you can see the necessity of a properly designed and constructed valve mechanism.

Here, again, note that these points of Abbott-Detroit superiority are not evident on the surface.

Models and Prices

34-40	Roadster,	116-inch wheel base	**$1700**
34-40	5-Passenger Touring car	116-inch wheel base	**$1700**
44-50	5-Passenger, Demi-Tonneau	121-inch wheel base	**$1975**
44-50	7-Passenger, Touring car	121-inch wheel base	**$2000**
44-50	Battleship Roadster,	121-inch wheel base	**$2150**
44-50	7-Passenger, Limousine	121-inch wheel base	**$3050**

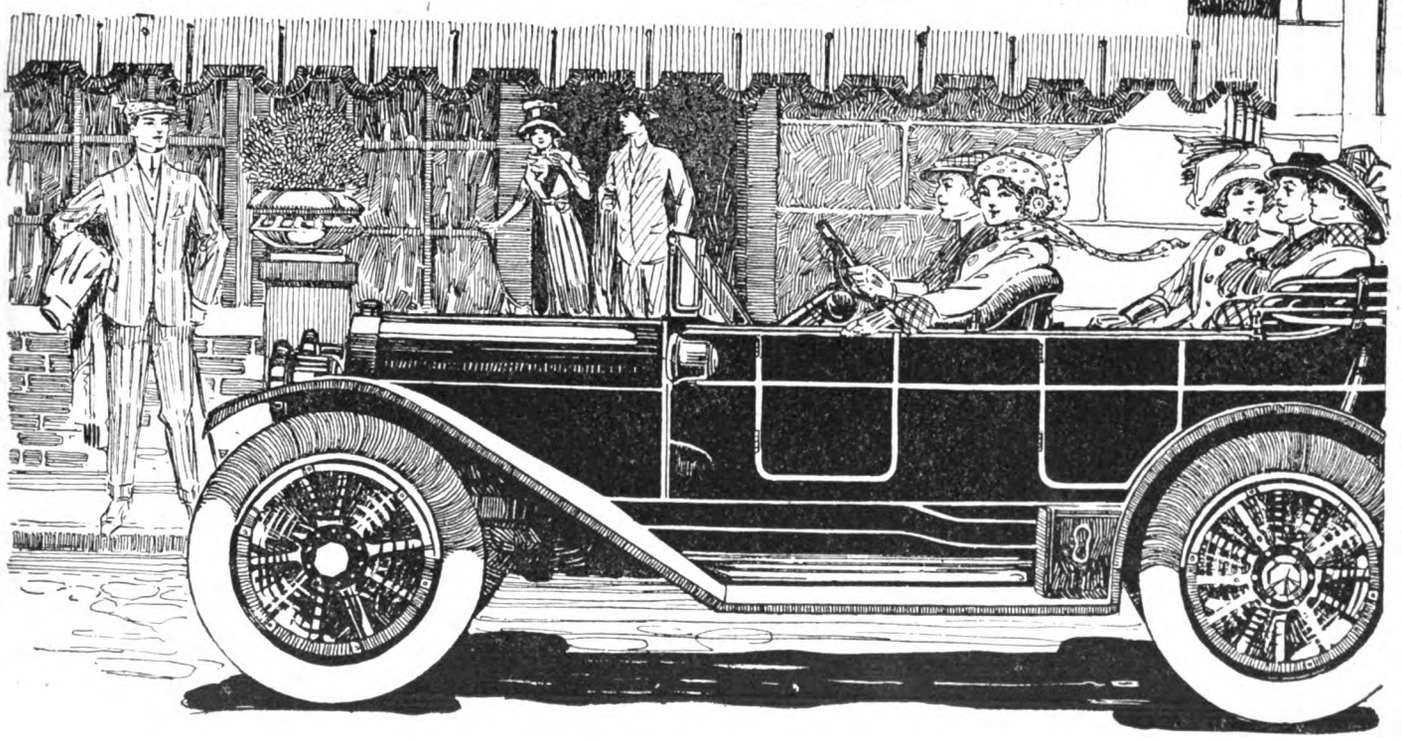
Advance Catalog on Request

Built for Permanence

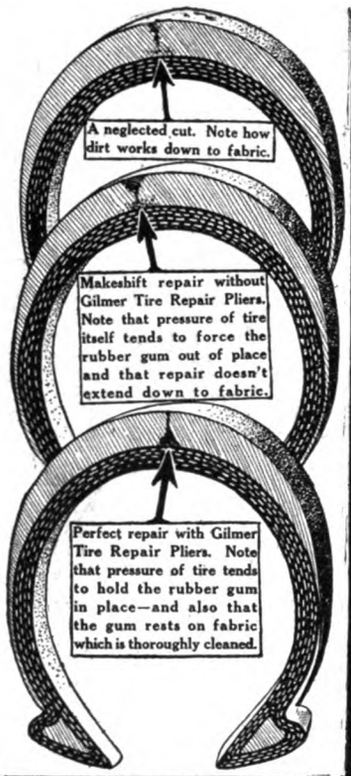
ABBOTT MOTOR COMPANY

607 Waterloo Street **Detroit, Michigan**

Guaranteed for Life



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Mr. Dealer— *Every Tool Kit Should Contain a Set of*

GILMER TIRE-REPAIR PLIERS

PATENTED TRADE MARK

$1 $1

That means, Mr. Dealer, that there is a pretty big field for the sale of this simple, remarkable accessory.

To prove to you that we are not overstating when we say that every tool kit should contain a set of Gilmer Tire Repair Pliers, we need only cite the fact that the use of these Pliers will about double your customer's tire mileage. Useless for us to argue with you about the value of selling such a commodity as this—a commodity that will double the tire mileage of your customer's car. You appreciate the merits of this just as well as we do. Now we offer you the opportunity to cash in upon this situation. Gilmer Tire Repair Pliers simply enable the tire user to protect himself against the small cuts which are the beginning of blow outs and which, up to this time, he has been unable to repair. The illustrations on this page tell the story better than we can. They show just exactly the use of Gilmer Tire Repair Pliers.

Don't misunderstand us in this regard. Gilmer Tire Repair Pliers do not take the place of tire outfits, nor do they take the place of vulcanizers. They enhance the value of each and increase the sale of each. If the cut is big enough to be vulcanized, the Gilmer Tire Repair Pliers enable you to clean the cut sufficiently so that it can be vulcanized properly. Nobody who has ever used rubber gum for repair under the ordinary conditions that obtained before the advent of Gilmer Tire Repair Pliers will need any coaxing to buy a set of these pliers. They will realize without any urging what a remarkable little instrument these pliers are in enabling correct tire repair. There is a good margin of profit for you in the sale of these pliers, and we have a special co-operative plan to help stimulate your sales that you will be glad to know about if you are a live one. Get in touch with us! It is well worth your while.



G. Walker Gilmer, Jr.

52 N. Seventh Street
PHILADELPHIA, PA.

The illustrations at the right indicate the method of repairing the tire with the use of Gilmer Tire Repair Pliers. The top view shows the pliers inserted in the cut. The middle illustration shows the jaws of the pliers partly open, exposing the fabric. The letter "A" indicates the lever attached to the moving jaw of the plier which also meshes in the ratchet and keeps the cut open. "B" indicates the cleaning tool with which the dirt and dust is scraped out of the cut. In the lower illustration the rubber gum is laid on the tool ready to be inserted in the cut which has been opened wide. After this rubber has been inserted in this cut and the pliers have been withdrawn, the repair looks as shown in the lower illustration in the upper left-hand corner of this page.

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COMING!!!

STANWELD
RIMS

THE
STANDARD
WELDING
COMPANY
CLEVELAND

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70% MORE TIRE MILES

WIRE WHEELS

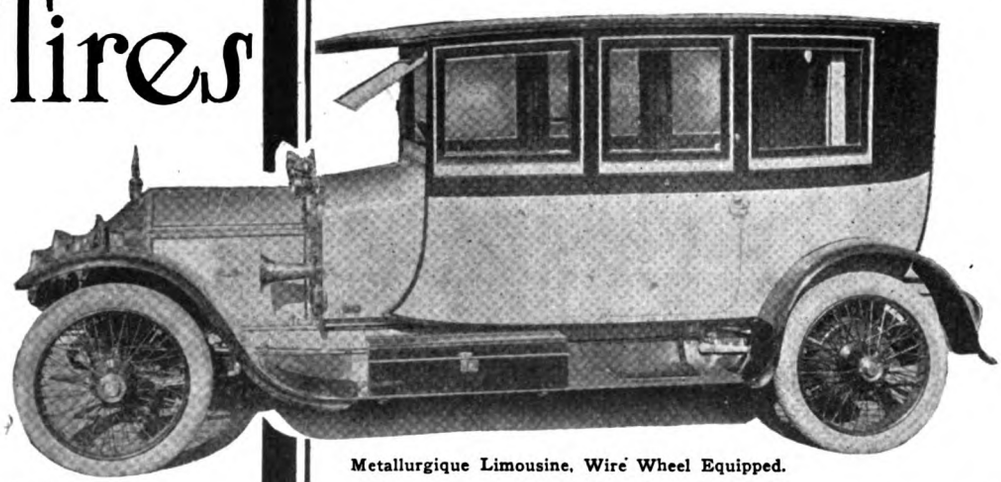
McCUE

Let Wire Wheels Solve the Tire Problem for You and for Your Customers, Mr. Dealer.

There are plenty of American manufacturers who are about ready to adopt wire wheels as stock. If your car maker does not keep apace with the trend you can find another who does. And it's self preservation for you dealers to insist upon the use of wire wheels. They will cut down tire expense so materially and increase the riding and driving qualities of your cars so greatly that wire wheels will reflect profit to you in generous measure.

Remember that it is in their use upon pleasure cars that wire wheels show up to real advantage and in greatest degree.

Save Tires

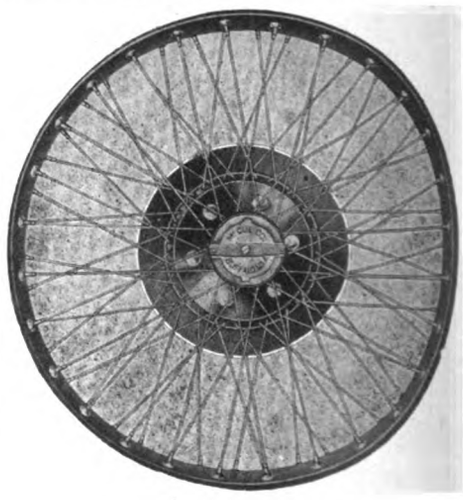


Metallurgique Limousine, Wire Wheel Equipped.

Save Engine

McCue Detachable Wire Wheels Can Be Demounted Very Easily and Very Quickly.

McCue Detachable Wire Wheels are really easier to mount and dismount than demountable rims. Besides they overcome all the terrific abuse the added weight of demountable rims inflicts on tires—**which abuse is the most direct cause of the short life and quick blowing up of tires to-day.**



McCue Axles Are Dependable

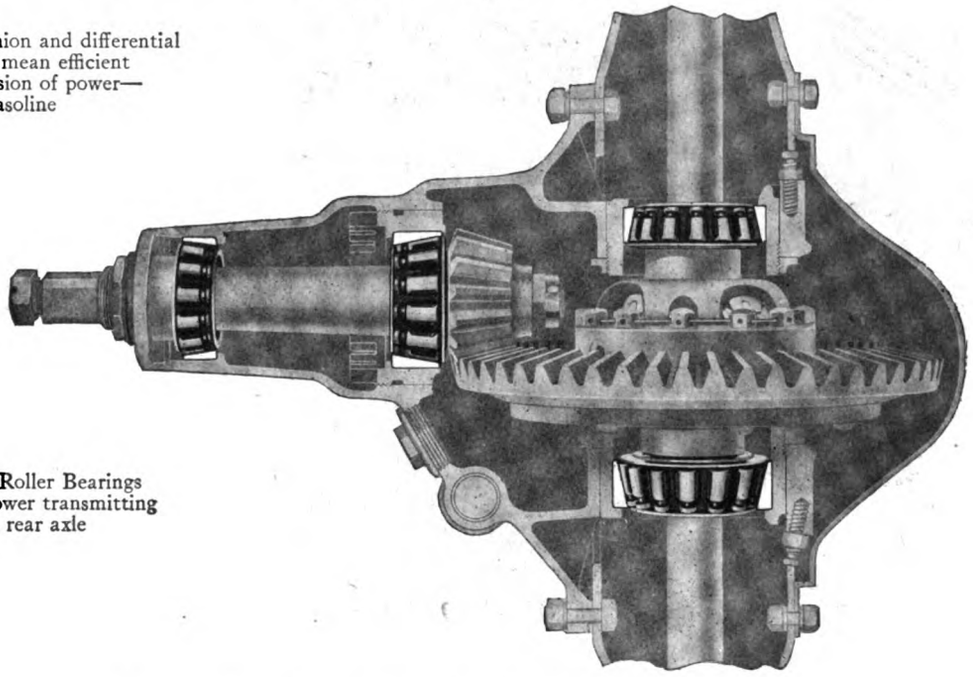
Not only are McCue axles dependable and superior in every way, but they admit of the use of either wire wheels or wooden wheels on the same spindle.

Save Money

THE McCUE COMPANY
Buffalo, New York

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Good pinion and differential bearings mean efficient transmission of power—saving gasoline



Timken Roller Bearings in the power transmitting unit of a rear axle

You Can't Afford the Risk and Cost of Inferior Bearings

FINITE man has never yet been able to make anything that will not wear. Bearings—any bearings—are no exception. Steel of right chemical formula, heat-treated in the right way, hardened and ground to microscopically exact dimensions—helps bearings to resist the inevitable wear.

TIMKEN
TAPERED ROLLER BEARINGS

But beyond the story of steel, which all bearings can tell, comes principle of design.

To hold bearing-wear to a minimum, pressure must be held to a minimum. It is far better to distribute pressure over the entire length of rollers than to concentrate it on mere points as with balls.

Timken Tapered Roller Bearings are right in steel and right in steel-treatment.

The taper of their rollers and cups and cones, gives them ability to meet "end-thrust."

Their rollers sustain the greatest loads and hold wear down to a minimum.

The Timken principle of design is so good that even this minute wear can be completely taken up by adjustment without the least sacrifice of its theory of design or practical operation.

And Timken Roller Bearings are meeting the absolute tests of actual service in thousands of pleasure and commercial cars in all parts of the world, under all conditions of load or road.

The Timken Roller Bearing Company

Canton, Ohio, U. S. A.

The only axle manufacturer licensed to make automobile axles equipped with Timken Roller Bearings is the Timken-Detroit Axle Company

114

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Knox

Commercial Vehicles
WIN THE CONFIDENCE OF THEIR OWNERS



FACTORIES
Woodhaven N.Y.
ROLLING MILLS TIN PLATE WORKS AND FOUNDRY
Harrisburg Pa.



BRANCH HOUSES
Chicago Boston

L & G Mfg Co TRADE MARK

Lalance & Grosjean Mfg Co

CABLE ADDRESS "AGATECLIFF" NEW YORK

256 BROADWAY New York. May 24, 1912.

Knox Automobile Company,
1966 Broadway,
New York City.

Gentlemen:-

In reply to your inquiry asking for an expression from us as to our experience in the use of your motor trucks, would state that the fact that we have just placed a new order with you for six 4-cylinder, Model "R-15", 3 ton trucks, should be sufficient evidence that our experience with your trucks in the last five years had been most satisfactory.

We have used Knox motor trucks exclusively for over five years and as we have used no other make, can give no comparison as to the efficiency, up-keep, etc., but it is sufficient to state that our experience with your machines has been so satisfactory we have just placed with you the above order. Our experience with your machines and the courtesies extended by your company have been so satisfactory that we take pleasure in adding our testimonials to the many others you already have.

Very truly yours,
LALANCE & GROSJEAN MFG. CO.

J.H.W./B. President.

Send for Catalogue "W"

KNOX AUTOMOBILE COMPANY, Springfield, Mass.

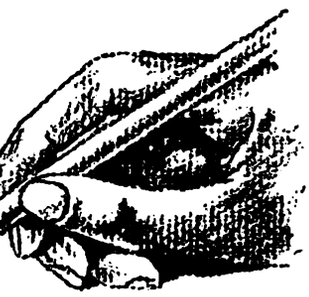
New York—BRANCHES—Chicago

"Recognized as America's Highest Standard Since the Beginning of the Industry"

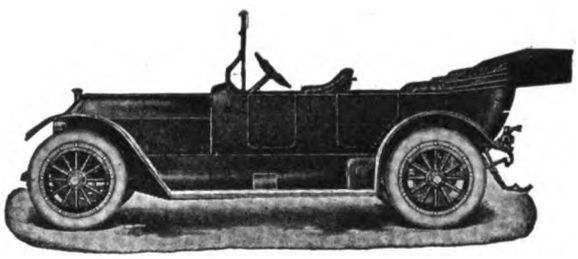
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My next Car will be a Knox

"Little Six"



The Writing on the Wall



A Distinctive Car of Exceptional Merit

Send for Advance Folder "M" of 1913 Models

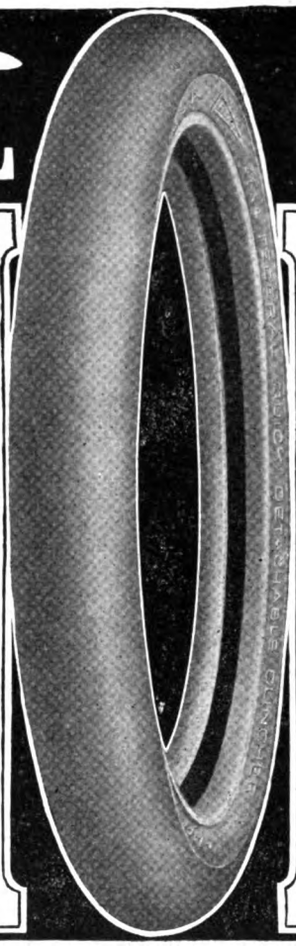
KNOX AUTOMOBILE COMPANY, Springfield, Mass.

New York—BRANCHES—Chicago

"A Demonstration is Irresistable"

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FEDERAL TIRES



Get *Extra* Service

Federal Tires are exceptional from the standpoint of standing the strain of road usage long beyond the natural life of most tires. They are known everywhere as the tires of *extra* service.

Extra service is of utmost concern to tire buyers because it lowers the cost of tire equipment. Federal Tires last longest, therefore eventually cost the least.

Try Federal Tires and watch them roll off miles and miles and last months and months you never thought within the capabilities of any tires.

Get *More* Satisfaction

Every automobilist looks for tire satisfaction and has a right to expect it, though dissatisfaction is very often their experience.

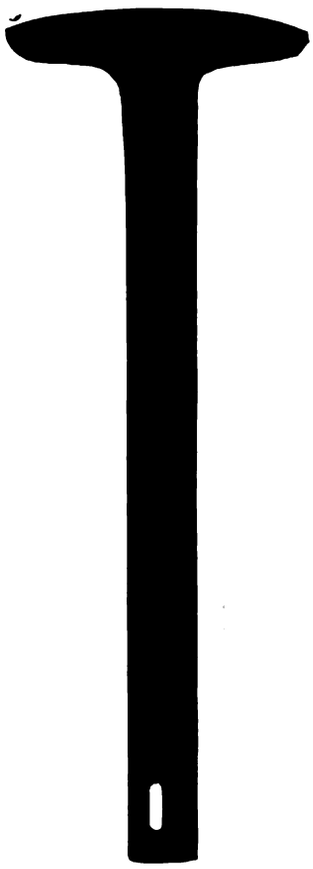
One way to get complete tire satisfaction is to buy Federal Tires—they are expressly built to provide the most durable service, the greatest resiliency and the utmost in comfort. *Give these tires a trial.*

Made in all types for all standard rims

Federal Tires are supplied through leading dealers everywhere. An interesting tire book mailed to all who write.

Federal Rubber Mfg. Co. Milwaukee

Branches and Agencies:—*New York, Boston, Chicago, Kansas City, Minneapolis, Denver, Indianapolis, Columbus, St. Louis, Louisville, Omaha, Little Rock, Atlanta, Los Angeles, San Diego, Pasadena, New Orleans, Portland. (Federal Rubber Mfg. Co. of Texas—Dallas, Houston, San Antonio.)*



THINK THIS OVER

very carefully and read it twice, if necessary.

Is there any part of an automobile engine, or any other gas engine, that is more important to its efficiency than a Valve?

Your engine leaves the factory running smoothly and sweetly—tuned up to its highest power. Perhaps the valves pit—warp—go out of shape—fail to hold compression. Then the power diminishes, and what can be more aggravating to the driver, who has known the fullness of the pulling power of his motor, than to have it grow less and less?

You cannot slight this part by putting in an inferior product—valves that will give trouble, or even break from inexperience in their manufacture—valves of unsuitable material, not suitably heat treated.

Too much is at stake, and a slight extra cost at the outset, which is the exception, may save you many times over a probable later expense.

This Company, with the experience of many years as a guarantee, will furnish you with properly made valves, of the materials best adapted to your requirements.

Not only QUALITY, but efficient SERVICE is a factor—surely there is a satisfaction in getting the kind of work you want—when you want it.

THE ELECTRIC WELDING PRODUCTS COMPANY
CLEVELAND, OHIO

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Every Business Man Can Use an International Commercial Car

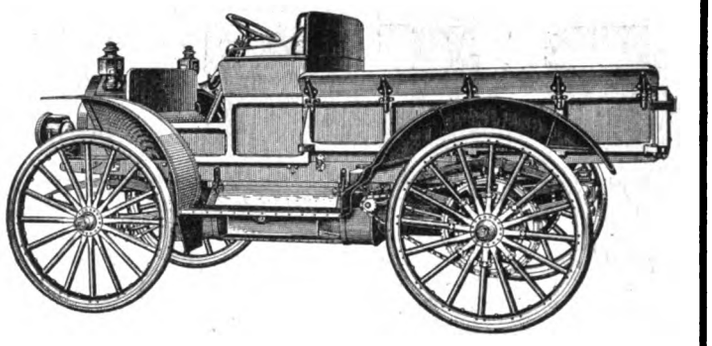
To the man who sells automobiles, the International Commercial Car presents an interesting and attractive proposition. It occupies a field of its own. The fact that a man already owns an automobile makes him a better prospect for an International Commercial Car, especially if he is a farmer or a business man who does light hauling or makes deliveries.

Better Than Horses

The International Commercial Car is more reliable than horses. It works long hours without rest. It travels over roads where mud, sand, snow, or ice would make it cruel to drive horses. It is a better investment than horses.

Less Expensive

The International Commercial Car costs less than horses and wagons to do the same amount of work, and the up-keep cost is less. It costs nothing when not working. It does not require so much care as horses. It is a money-saving proposition for a business man from every point of view.



Strictly a Commercial Car

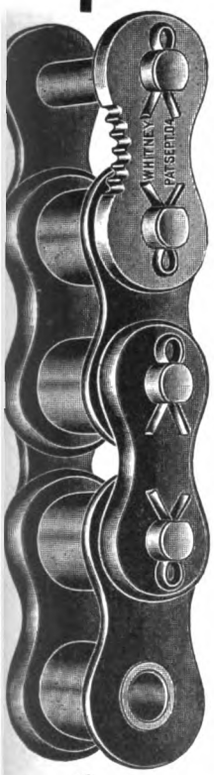
It does not compete with pleasure cars. It is strictly a commercial car, whose size, power, shape, transmission, tires, road clearance, construction, price—all are the result of years of experience in building a car to prove satisfactory for light hauling and quick deliveries in the hands of average drivers.

This is the Car We Ask You to Sell

Can you do it? If you think you can, our proposition will interest you. Better write for it anyway and see just what we have to offer. Address

International Harvester Company of America

155 Harvester Bldg. (Incorporated) CHICAGO, U. S. A.

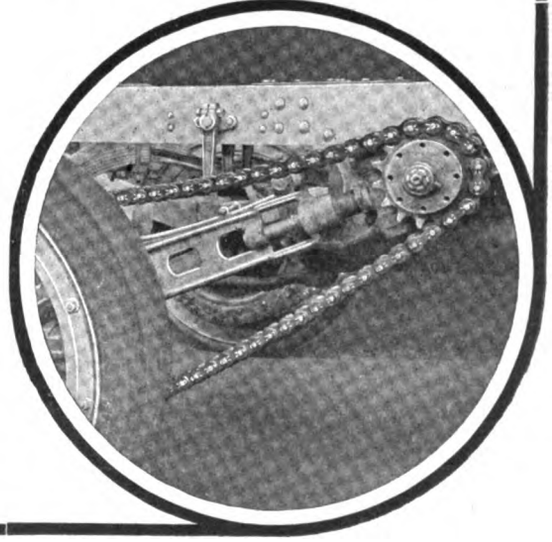


"Whitney" Chains

The Most Practical for Motor Trucks

Because the "Whitney" Cotter Detachable Chain can be easily separated at any link and lengthened, shortened, or repaired without the use of any special tool. This is of great advantage to truck builders, owners and drivers.

"Whitney" Chains are used by the leaders because they are strong, accurate, dependable and, above all, long lived. They are made right and they're made from the right kind of material, thus giving highest efficiency. When making replacements insist on a "Whitney" Detachable.



"Whitney" Chains Are Built for Strains

The Whitney Mfg. Company

HARTFORD, CONN.

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BENZ

Since the introduction of BENZ cars to the motoring public of America no car has attained such world-wide supremacy as to its construction, standing up quality, and material. The new type of 35 and 50 H. P. BENZ models are the last word in automobile construction.

The noticeable features of this type of BENZ cars include the offset crank shaft, smokeless oiler, and SILENT CHAINS instead of timing gears.

The BENZ Carrosseries are noted for their beautiful lines and thorough comfort.

To those desiring AGENCY of this car the Benz Company will offer special terms. We want RELIABLE, ENERGETIC agents to further our interests for both BENZ pleasure cars and BENZ-GAGGENAU trucks, which today stand recognized by those who know, as the leading 6-ton truck. Wire or write us, no matter where you are.

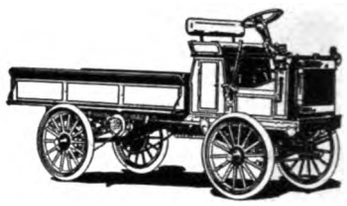
Our PRICES compete with LEADING AMERICAN makes.

BENZ AUTO IMPORT COMPANY OF AMERICA
250 West 54th Street New York, N. Y.
Direct Branch of Benz & Cie., Mannheim, Germany.

Sanford

Above all things else sell trucks that are accessible.

Chassis $1600



Stake or Express Body $1700

It is not enough that the truck of today should be well built—the truck of today must be accessible.

There is no truck more accessible than the Sanford, nor is there a truck more substantially built.

This means that repeat orders are assured to dealers who sell Sanford trucks.

If the Sanford truck is not sold in your territory, get in touch with us right away. No manufacturer has offered to dealers so remarkable a proposition as we offer.

The Sanford Motor Truck Co.
SYRACUSE, NEW YORK

Remy Magneto

Exchange Your Old Magneto for a New Remy

IT will cost you practically no more than what you will be forced to pay out for constant repairs on your present ignition system. A new Remy will give your car new life. Here is our exchange proposition:

	List Price	Allowance	Net to You
2-Cylinder Remy Magneto with Coil, complete.....	$46 00	$ 9 20	$36 80
4-Cylinder Remy Magneto with Coil, complete.....	50 00	10 00	40 00
6-Cylinder Remy Magneto with Coil, complete.....	52 00	10 40	41 60

Allowance made for any make of Magneto.

Remy Electric Company
Anderson, Indiana

BRANCHES—New York, Boston, Detroit, Chicago, Kansas City, San Francisco, Indianapolis.

SERVICE STATIONS—Albuquerque, Augusta, Baltimore, Charlotte, Cincinnati, Cleveland, Denver, Dallas, El Paso, Houston, Jacksonville, Louisville, Memphis, Minneapolis, New Orleans, Nashville, Norfolk (Va.), Omaha, Los Angeles, Philadelphia, Pittsburgh, Portland (Me.), Portland (Ore.), Rochester, San Antonio, Seattle, Spokane, St. Louis, Syracuse, Utica, Washington (D. C.)

CANADA—Toronto, Winnipeg, Calgary, Hamilton, Vancouver, Montreal.



All Tire Manufacturers will only guarantee their produce when filled with air at the recommended pressure.

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POSITIVE LOCK STOP

Air Gauge

With it you can get more mileage out of the Tires, because you can always keep them at right pressure.

The Twitchell Gauge is Tire Insurance for a dollar—Order one from your dealer or from us direct.

THE TWITCHELL GAUGE CO.
1256 Michigan Ave. CHICAGO, ILL.

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The Largest Automobile Supply House in America

15—STORES—15

This is a Turn-Down Burner, i. e., you can reduce the size of the flame without carbonizing the burner.

The Greatest Gas Economizer and the Longest Lived Burner made.

Throw away your old-style burners and send us 80 cents for a pair of these.

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A TROUBLE SAVER FOR THE MOTORCYCLIST

Price 25 Cents

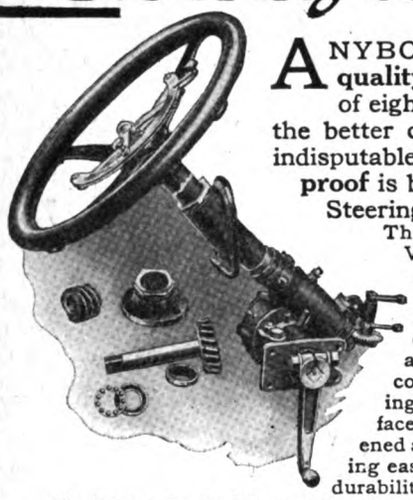


Bicycling World Company

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Warner Quality
Steering Gears



ANYBODY can claim quality—but a record of eight years use on the better class of cars is indisputable proof. That proof is back of Warner Steering Gears.

The prime features of Warner Gears are: accessibility; complete interchangeability; use of eccentric sleeves; adjustable angle of column; large bearing and contact surfaces specially hardened and ground, assuring ease of motion and durability.

The Warner line includes a wide range in both pleasure and commercial types.

We guarantee dependable deliveries.

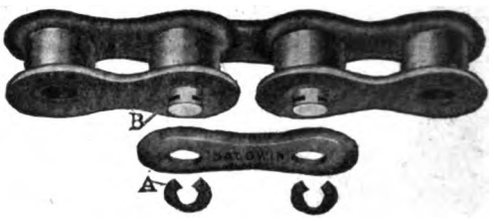
Get acquainted with Warner Quality—make it another selling argument.

We modify our designs to meet your detail requirements, or build on approved designs on seasons quantity specifications.

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628 Ford Building

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Warner Gear Co.
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Baldwin Drive Chains
BOTH DETACHABLE AND RIVETED

are used by the largest, most exacting users of chains for automobiles in the world. They need no further recommendation.



SPROCKETS We are equipped to make sprockets in large quantities at interesting prices.

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Rates:

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$1.50 and $2.00

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Large, Comfortable Rooms

Grill Room Popular Prices

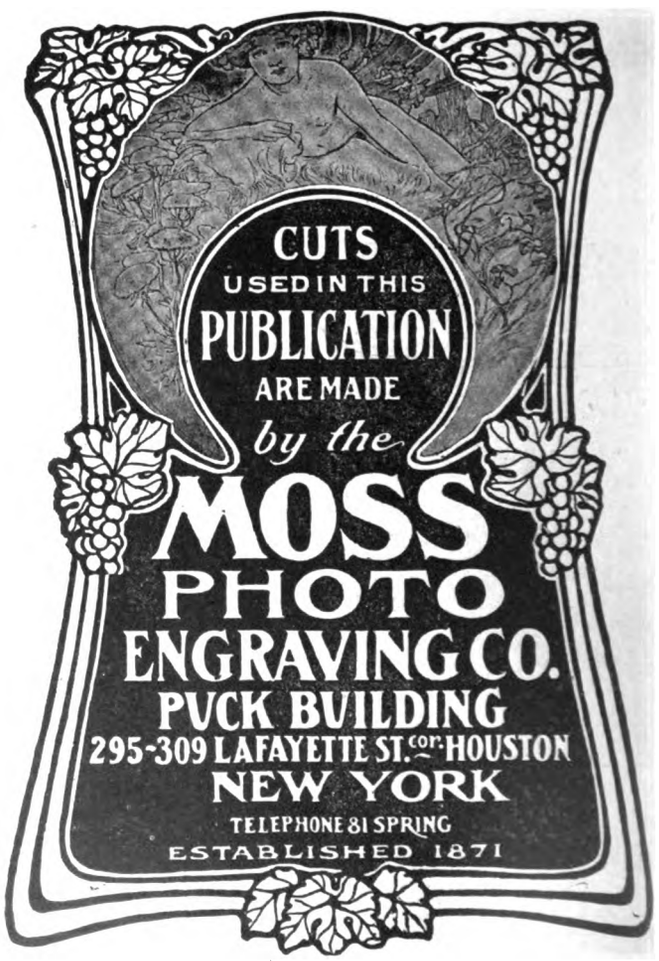
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In All the World No Car Like This

Ten successful seasons—the wonderful long stroke motor—added improvements and refinements give this wonderful car the greatest value ever offered for $1800. Read the list below of the most notable features of the

Dreadnought Moline M-40

10 inch more wheel base (now 124)
Electric Lights—Dynamo System
Five more Horse Power (now 40)
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Gasoline Tank under Cowl—
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DEALERS—We have a square deal proposition for you. Unique in many ways. Well worth writing for.

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The Elgin Trophy
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Grand Prix de France
for Light Cars and
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Be Satisfied **Specify Bosch**

Write for September Bosch News

BOSCH MAGNETO COMPANY
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Model K2
Price $75

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THE decision of the prominent manufacturers to equip with the Warner Auto-Meter in 1913 constitutes OFFICIAL RECOGNITION by the automobile industry. High priced cars have long boasted Warners. More than 100,000 new cars will be Warner equipped this season.

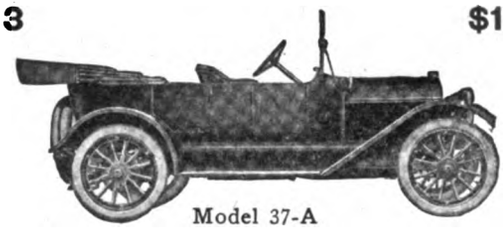
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The Warner Instrument Company
Beloit, Wisconsin

BRANCHES—Atlanta, Boston, Los Angeles, New York, Buffalo, Chicago, Philadelphia, Pittsburgh, Cincinnati, Cleveland, Portland (Ore.), Denver, San Francisco, Indianapolis, Kansas City, Seattle, Detroit, St. Louis.
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1913 **$1475**



Model 37-A
Completely Equipped

Disco Self-Starter.
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Concealed Tool Boxes.
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Ventilating Windshield.
Nickel Plated Trimmings.

Write for illustrated advance folder giving full details.

To automobile dealers we offer the fairest sales agreement ever written. Ask us about it.

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Stop Tire Troubles

The one weak point of the automobile is that you cannot depend on the tires. Thousands of motorists have solved their tire problem by discarding inner shoes, reliners, fillers and other makeshifts and equipping their tires with **Interlock Inner Tires.**

Interlocks are complete inner tires (not inner shoes) placed between the outer casing and inner tube to strengthen the casing and protect the tube from punctures. They double the mileage of new tires and add 1,000 to 5,000 miles to old ones—save half your tire expense—and make tires trouble proof.

Dealers and Motorists—Investigate Interlocks

Don't delay—write now for booklets, data, prices, testimonials of users, road tests, etc. Mention size and kind of tires you use.

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THE ONE-MAN TOP

The only Auto Top which can be handled by one person as easily and quickly as an umbrella. No front supports in way of your arms when driving.

GOLDE-PATENT MANUPACTURING COMPANY, 515 West 56th St., New York City.

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SAVED BY BUYING NOW

$30.00 for a **$105.00** **6** cylinder
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Imported U. & H. High Tension Magnetos Less Than Import Cost.

Circular and Price Lists Free

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Champion Spark Plugs

Special Designs for Every Type of Motor Made

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TOLEDO, OHIO

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First and Second, Illinois Trophy, Elgin, Ill., August 30th.

Merz, the winner, averaged 66.11 miles per hour, lowering record made in 1911.

Our New Series B—both Four and Six-cylinder Models—are now ready for delivery.

Write for announcement folder A-10.

IDEAL MOTOR CAR COMPANY
Manufacturers of Stutz Motor Cars
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SPLITDORF
MAGNETO
"Always There"

SPLITDORF ELECTRICAL CO.
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TRANSMISSIONS Suggest COVERT — COVERT Implies QUALITY!

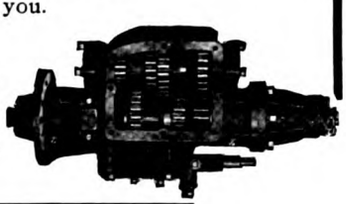
We make the best TRANSMISSIONS and at the least cost to the buyer.

We have the experience, equipment and determination.

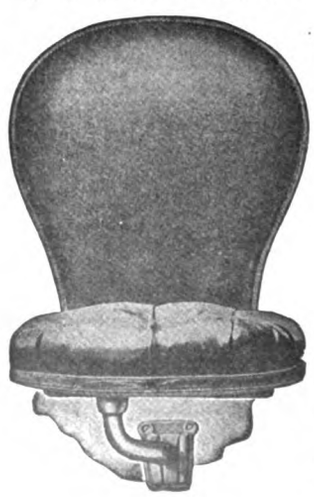
The many who use them believe we do.

We believe we can convince you.

Will you let us try?



COVERT MOTOR VEHICLE CO.
Sales Office:
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Patent "Luxury" Folding Seats

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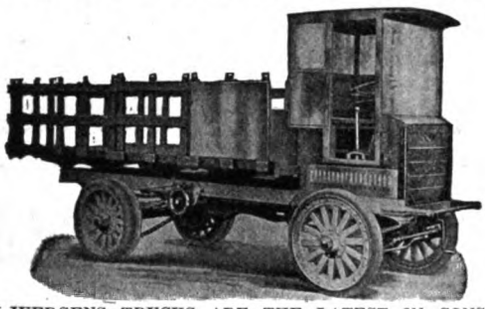
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QUALITY DURABILITY

ONE, TWO AND THREE TON CAPACITY



LAUTH-JUERGENS TRUCKS ARE THE LATEST IN CONSTRUCtion, most powerful in operation and the motors are guaranteed against defective workmanship and material for the life of the truck. They are positively the highest class trucks made. Two cylinder, one-ton, four cylinder, one, two and three-ton. Four speeds forward, Hess-Bright ball bearing transmission made in our own shops of the finest tool steel, three-piece disc clutch, covered by patents owned by us. Send for 1912 Catalog and specifications. Prompt delivery on all models. Large publicity campaign just begun. Our quality will do the rest.

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NEWARK, N. J.—Merchants Motor Car Co., Essex Building.
DETROIT, MICH.—Bierl Auto Truck Sales Agency, 453 Dix Ave.
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The "Schafer" ball bearings are the standard of the world. They have been for years at the pinnacle of merit, and remain there because of exceptional workmanship, and the care taken in every step of the manufacture.

The ball bearings are made of especially analyzed, extraordinarily dense crucible cast steel, that combines uniform hardness with toughness from center to surface. All balls show a wonderfully great crushing strength and any ball showing the slightest defect is promptly rejected.

In specifying Schafer Ball Bearings, the manufacturer of the car is assuring the ultimate buyer of one point of quality that goes to make a good automobile still better.

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PERFECT LUBRICATION and the elimination of noise are two features exclusive in HYATT ROLLER BEARINGS. The hollow, tubular roller becomes a reservoir for the lubricant.

LEXIBILITY IS IMPOSSIBLE in solid rollers or balls. It's essential though, in reducing the noise in bearings. Hyatt Flexible Rollers absorb vibrations and cushion shocks.



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Stewart Delivery Cars

Chassis $1650

STOCK BODIES

Panel	$150
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A Car for the Merchant to Buy

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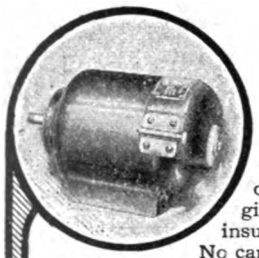


DUPLEX EXTERNAL BRAKES

These brakes are superior to any other known make. They "brake" a car backing DOWN hill—if necessary. They prevent accidents and make every car safe.

THE ROYAL EQUIPMENT CO.
436 Housatonic Ave., Bridgeport, Conn.
We also make Raymond Brakes, Raybestos Friction Facing and Gyrex, the Mixer.

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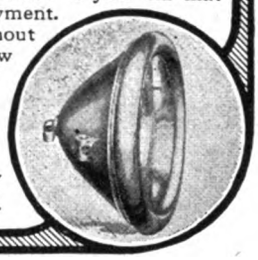


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The equipment that robs night driving of all its annoyances and dangers and gives you the confidence in your car that insures perfect enjoyment.

No car is complete without an Aplco System. Specify it on your new car or write us about our outfits to bring your old car up-to-date.

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Any Kind Every Kind Stock, or to Blue Print

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For Automobiles, Motor Trucks, Aeroplanes, Motorcycles, Bicycles.

We Also Make Axles and Hubs.

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R. B. ABBOTT SALES CO., Sales Agents, Detroit

The Reasons for Jencick Quality and Jencick Prices are worth knowing.

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For Motor Trucks

from base to spark plug, have features that are "Different and Better."

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Port Chester, New York

The First Speedometer
JONES

First instrument made, first in the Gold Medal Trials, first in the minds of motorists who demand accuracy.



THE JONES SPEEDOMETER
Factory: New Rochelle, N. Y.

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Model 40

THE GRINNELL
Gas Controller and Igniter

Price $30

Lights, dims and extinguishes all gas lamps on the car through a simple turn of the hand. Coupled to valve-stem of acetylene tank. Direct control. Always within easy reach.

Convenient—Safe—Dependable

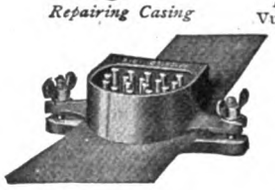


Every car owner in your vicinity, Mr. Dealer, will be interested—it's up to you to show them—and sell them. Write for booklet and dealer discounts.

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Sole Licensed Manufacturers for the United States



Repairing Casing



TIRE CUTS ruin casings. They admit moisture to the carcass, cause the fabric to rot and weaken, grow larger—end in blowouts.

You can repair **CASINGS** and **INNER TUBES** anywhere in 15 minutes, better than a Repair Shop can do—and for *one cent.*

Universal Auto-Vulcanizer
Patented

A practical vulcanizing outfit complete, with enough repair gum to make 40 patches. It weighs 3 pounds and can be carried in the tool box. **Simplest and most satisfactory device for eliminating tire troubles that has ever been devised.**

Absolutely automatic. Place the patch—attach the Vulcanizer—put in the gasoline—light it. No further attention required. In 15 minutes the job is done.

It *can't burn, scorch* or *injure* tube or casing. It can't get out of order. It *can't* fail to do its work. So simple, anyone can operate it. The Universal Auto-Vulcanizer saves its cost a *hundred times* over in trouble and expense.

Price Complete, **$4.00** Ready for Instant Use
Guaranteed Satisfactory or Money Refunded
ADAMSON MFG. COMPANY, East Palestine, Ohio

AUTOMOBILE OWNERS AND TOURISTS

should break their journey and avail themselves of the excellent facilities afforded by the D. & C. Lake Lines, operating daily service between Detroit and Buffalo and Detroit and Cleveland.

Enjoy the delights of the cool breezes from Lake Erie and resume your journey in the morning after a refreshing night's rest. Special attention given by this Company to the handling of automobiles. Rates quoted on application (state wheel base); Tanks of Automobiles must be emptied of gasoline before being shipped; three gallons of gasoline supplied free on arrival at destination.

Roads in this section of the country are in first class condition; new road now under construction between Detroit and Toledo. Tourists speak highly of the route between Buffalo and New York.

On your trip this summer bear in mind "The Waterway is The Only Way."

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Ignition Absolutely Sure

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Also Makers of **RAJAH TERMINALS**- the Best Made



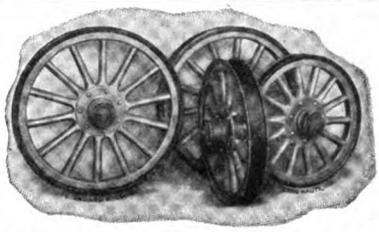
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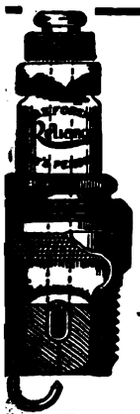
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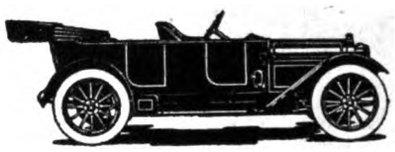
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40-Horsepower Touring Car or Roadster, absolutely silent in operation. Cylinders 4½ x 5¼-in.—116-in. wheelbase—34 x 4-in. tires—demountable rims—nickel mountings—massive, straight line body—big, roomy seats—proved self-starter—everything. Price $1500. Guaranteed for life by the Michigan Buggy Company. 40-horsepower Roadster on the same chassis. Two smaller models. Catalog on request.

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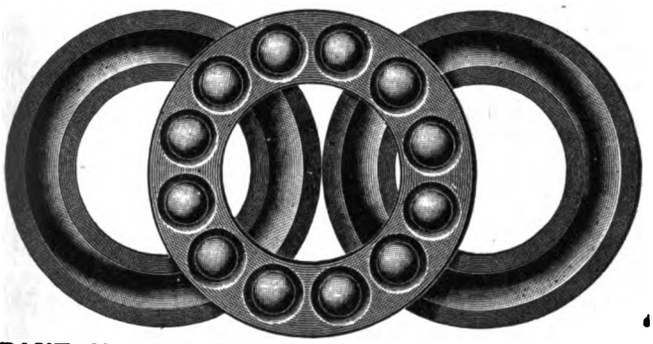
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Motor 3¼ x 5½ inches; four cylinders; Bosch magneto; three speed sliding gears; tires 32 x 3½ inches; 106 inch wheelbase. Equipment includes windshield, gas headlights, generator, oil lamps, tools and tire repair kit.

Roadster body on same chassis and with same equipment, $900 F. O. B. Detroit.

Runabout—$750
F. O. B. Detroit. Same power plant as World-Touring Car. Wheelbase, 86 inches. Equipment of top, windshield, gas lamps and generator, oil lamps, horn and tools.

20 H. P. Models

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Series Eight comes in Three Chassis:

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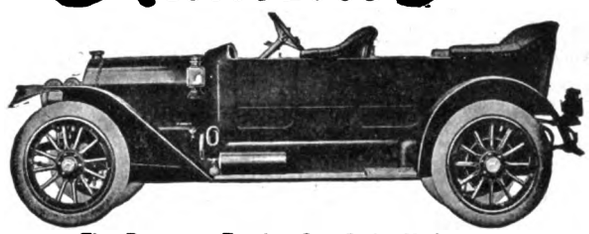
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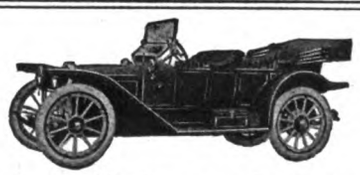
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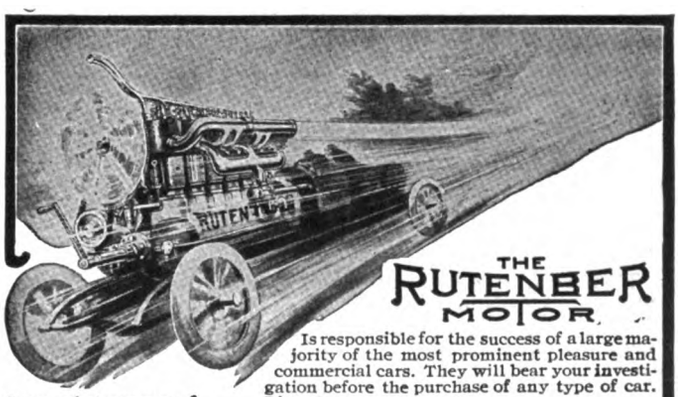


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4-Passenger
$2,700
Fully Equipped including Self-Starter

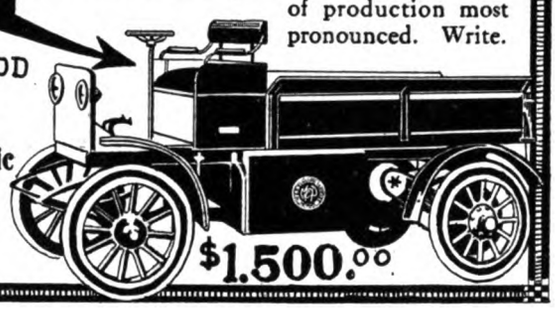


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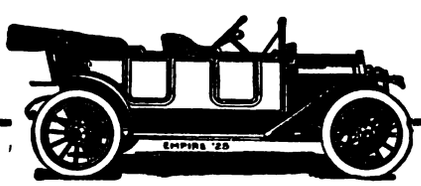
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This is the Big Brother of the Famous Empire Roadster and is a **small edition** of $5,000 cars.

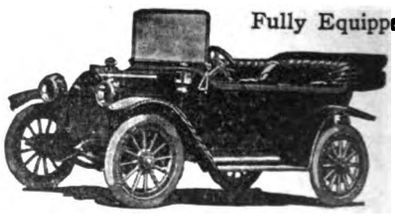
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25 H. P. Long Stroke Motor

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Great Ease of Riding — Carburetor Dash Adjustment
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Cutting C-55, 132-in. wheelbase, 55 h. p.
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CLARKE-CARTER AUTOMOBILE CO.
305 Mechanic St., Jackson, Mich.



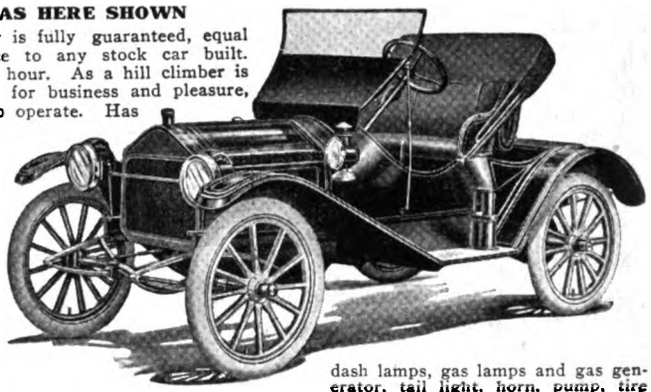
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$495.00

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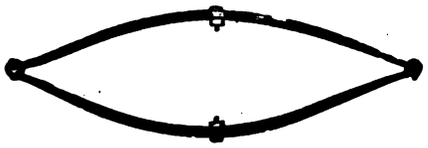
DEALERS

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Other features include: Four-cylinder, water cooled motor; Bosch magneto; full elliptic springs all around; best quality clincher tires; torpedo semi-enclosed body; extension top, with curtains entirely enclosing car when desired; dash lamps, gas lamps and gas generator, tail light, horn, pump, tire and tool outfit—a strictly high class Roadster, completely equipped for $495.00.

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Why We Blow Our New Electric Continental Horn

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"INSURANCE FOR BUILDER AND USER"

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"THE MASTER CAR" FIFTEENTH YEAR

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(Completely Equipped)

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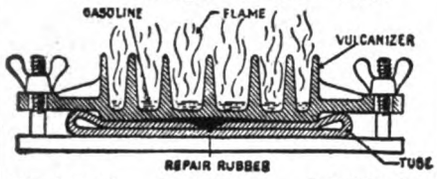
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The Imperial Vulcanizer Repair Kit

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Nickel Plated Weighs 3 Lbs. Patent Pending

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For the Gentleman and Gentlewoman

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ARGO ELECTRIC VEHICLE CO., Factories, Saginaw, Mich.
Metzger-Herrington Co., Distributors,
2412-14 Michigan Ave., Chicago.



RELIANCE
"The Speedometer of Quality"

Special features that eliminate speedometer troubles. Send for the booklet.

Reliance Speedometer Co.
134 Eliot St. Boston, Mass.

REPUBLIC
STAGGARD TREAD
The Tire Perfect!

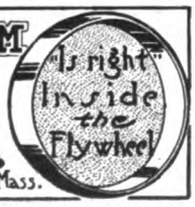




Tones down headlights for city driving and foggy nights—an auto necessity. Price 75c. per pair. Sell like hot cakes. Dealers, secure the agency quick.

F. H. TOBIAS
1931 Broadway, New York

The Otho System for Self Starting Lighting Ignition Signalling



Otho Motor Co., 60 State St. Boston, Mass.

Weed Chains

The Great Anti-Skid DEVICE

Nine-tenths of all accidents to automobiles are caused by skidding or slipping.

Either you skid into the "other fellow" or the "other fellow" skids into you.

No matter how careful a driver you may be, you cannot prevent skidding or slipping on wet, muddy snow-covered roads or on icy, slippery greasy pavements unless you equip your car with Weed Chains.

Cannot Injure Tires
Because They Creep

An absolute necessity on both rear wheels and if you want to know what real steering steadiness means put them on the front wheels too.

For your own safety—for the safety of the public, fully equip your car with Weed Chains. Make it your business to get a set today.

The Name "Weed" on Every Hook

Recommended and sold by all reputable dealers

Weed Chain Tire Grip Co.
28 Moore St. New York

Standard Bearings are Enemies of Friction.
Why Don't You "Standardize"?
Standard Roller Bearing Company
PHILADELPHIA

"National" Steam Vulcanizers

GARAGE MODEL repairs three tubes and two casings at a time. Cheapest and best on the market. Get our special selling plan. Portable model for individual owners which will please your customers. List price, $12. Manufactured by

THE NATIONAL MOTOR SUPPLY CO.
1904 Euclid Ave. CLEVELAND, O.

75% Increase in Tire Efficiency

That's what the INNERSHU accomplishes. It's a tough, durable, rubberized fabric formed permanently to tire shape. Ask for circular.

INNER SHOE TIRE COMPANY
Front Street Grand Rapids, Mich.

Locomobile Cars for 1912

Complete information furnished on request.

The Locomobile Company
BRIDGEPORT, CONN.

Auto-Top Fabrics
OF EVERY DESCRIPTION
SAMPLES AND PRICES ON REQUEST
L. J. MUTTY CO., Boston

The National-Acme Mfg. Co.
Automatic Screw Machinery and Their Products.
CLEVELAND (Sixth City)
New York, 77 White St. Chicago, 23 So. Jefferson St.
Detroit, 1222 Majestic Bldg. Boston, 141 Milk St.
Atlanta, 3rd National Bank Bldg. Montreal

We have something brand new to offer in
COTTON WASTE at a saving of $40.00 per ton. **DIXIE BRAND**
Write for samples and particulars.
FOWLER WASTE MANUFACTURING COMPANY
Vineland, N. J.

INVADER OIL
"The Best the World Affords"
CHAS. F. KELLOM & CO.
Philadelphia Boston

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These Tires for You

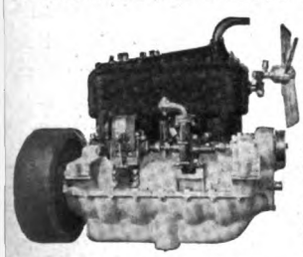
Four corps of experts working in four of the best equipped tire plants in the world are operating as a unit to produce.

UNITED STATES TIRES

Nothing of the kind has ever before been attempted in automobile tire manufacturing.

United States Tire Company
New York

"CONTINENTAL"
Best Known Motor in America



Look for the name "Continental" on crank case.

We have looked after the qualiiy behind it.

4 and 6 cylinders, 20 to 60 H.P. Write for Booklets.

Continental Model "C"

CONTINENTAL MOTOR MFG. COMPANY
Detroit, Mich.
FACTORY REPRESENTATIVE:
K. F. Peterson, . 150 S. Michigan Blvd., Chicago

The Bush Radiator
THE BUSH MANUFACTURING CO.
HARTFORD, CONN.

Reo the Fifth

Final and crowning achievement of R. E. Olds, pioneer designer of autos. A standard size 30 to 38 horsepower four cylinder car of modern refinements priced for the present at only $1,055.

(38) R. M. OWEN & CO., General Sales Agents
REO MOTOR CAR CO., Lansing, Mich.

The NIAGARA Self Starter
Is "As Dependable as Niagara"
Simple as It Is Efficient
Good Territory Open
THE NIAGARA SALES COMPANY
704 Main Street Buffalo, N. Y.



We Ship on Approval
Prepay Freight, and allow
30 Days Free Trial

IT ONLY COSTS ONE CENT to learn our unheard of prices and marvelous guarantee on "Brictson" Detachable Treads.

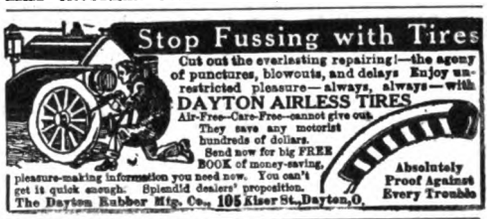
Let us show you how to save from 300% to 400% on your tire expenses. Write to-day for full particulars.

The Brictson Mfg. Co.
No. 2492 Main St.
BROOKINGS, S. D





Magneto Plugs coax maximum power out of engine.
EMIL GROSSMAN COMPANY, Mfr., New York and Detroit



Aluminum Bodies
THE SPRINGFIELD TOP
(Pat. 1895)
SPRINGFIELD METAL BODY CO.
366 Birnie Avenue, Springfield, Mass.

STOP PAYING GARAGE RENT
Why Not Own Your Own Garage?

We are Manufacturers and Builders of Fireproof Steel Garages of all sizes. Write for Catalogue and prices.

THE FIREPROOF GARAGE COMPANY
1226 Ridge Avenue Philadelphia, Pa.

AJAX TIRES
Guaranteed 5000 Miles
Ajax-Grieb Rubber Company
General Offices: 1796 Broadway, New York City
Factories: Trenton, N. J. Branches Principal Cities

Kelly-Springfield Automobile Tires



Because of their unvarying quality and long service, thousands of satisfied automobilists use Kelly-Springfield Tires, and when they finally wear out they will buy more Kelly-Springfields.

KELLY-SPRINGFIELD TIRE CO.
20 Vesey Street, New York
Branch offices in New York, Chicago, Philadelphia, Boston, St. Louis, Detroit, Cincinnati, San Francisco, Los Angeles, Seattle, Buffalo, Cleveland, Baltimore, Washington, Atlanta, and Akron, Ohio.
Boss Rubber Co., Denver, Colo.
Appel & Burwell Rubber & Tire Co., Dallas, Texas.
Bering Tire & Rubber Co., Houston, Texas.
Todd Rubber Co., New Haven, Conn.



MOTZ Cushion Tires
For Pleasure Cars and Light Delivery Cars
Send for Booklet 58
...E MOTZ TIRE AND RUBBER CO.
Executive Office: Akron, Ohio

A—Shows double, notched treads.
B—Shows undercut sides.
C—Shows slantwise bridges.
D—Shows absorbing means when passing over an obstruction.

BRANCHES:
2020 Michigan Ave., Chicago
1727 Broadway, New York
1400 Race St., Philadelphia
900 Woodward Ave., Detroit
600 E. 19th St., Kansas City
2052 Euclid Ave., Cleveland
900 N. Craig St., Pittsburg
Standard Tire & Rubber Co., 104-106 Portland St., Boston
Distributors for New England States

Woodworth Treads
will help you to increase your business while benefitting your customers. We will send any responsible dealer a pair on 30 days' trial. Write now. Good Agents wanted for unoccupied territory.
LEATHER TIRE GOODS CO., Niagara Falls, N. Y.

The Ford Water Circulator

forces the water from radiator through cylinder water jacket, maintaining rapid circulation when car is in motion. Write for descriptive matter if you handle Ford cars.

THE FULTON-McCUTCHAN CO.
1146 Michigan Ave. CHICAGO, ILL.

GOODYEAR
AKRON, OHIO.

This name on Automobile Tires and Rubber Accessories signifies inherent qualities of material and workmanship that insure the maximum of service at the minimum of expense. (673)
The Goodyear Tire & Rubber Co., Akron, Ohio

Prest-O-Lite

The ONLY gas tank that when empty, can be immediately exchanged for a full one, ANYWHERE and ALWAYS.

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For Sale—Wants—Exchange

15 cents per line of six words, cash with order—In capitals, 25 cents per line—

A market place where Dealers, Jobbers and Manufacturers may buy, sell or trade used cars, parts and appliances and where help or situations may be secured at a nominal cost.

THE STEVENS-DURYEA COMPANY HAS ERECTED AND EQUIPPED A MODERN AND UP-TO-DATE FACTORY FOR MANUFACTURING THEIR OWN BODIES AND IS NOW READY TO RECEIVE APPLICATIONS FROM FIRST-CLASS WORKMEN IN THE SEVERAL BRANCHES OF BODY BUILDING: BODY MAKERS, SHEET METAL WORKERS, PAINTERS, UPHOLSTERERS, ASSEMBLERS, ETC. ADDRESS: SUPERINTENDENT, STEVENS-DURYEA COMPANY, EAST SPRINGFIELD WORKS, SPRINGFIELD, MASS.

OPPORTUNITY is offered to young man of selling ability who can command capital to secure a half interest in one of the most substantial and rapidly growing automobile agency businesses in New York State. Owns fireproof garage and salesroom in one city and rented quarters in nearby city and has exclusive agency for four of the best known cars, in unusually large territory. The value of the business is estimated at $130,000. One-half interest will be given for $60,000, of which $40,000 will go into the treasury of the company to be used in part for the construction of a fireproof garage to take the place of the rented quarters in the second city. BOX 218, Motor World, New York City.

ENAMEL YOUR LAMPS BLACK.
EXTRA FINE BLACK JAPAN.
The most elastic Enamel made. Dries in 10 to 12 hours. One or two coats may be used. Does not crack, chip or peel. Use on Lamps, Horns, Radiators, Fenders, etc. Air-drying. We also make the fine Baking Japan. Have your Garage or Supply Dealer order.
THE COLUMBUS VARNISH CO.,
Columbus, Ohio.

ATTENTION—Have a few manufacturers' samples, gentlemen's black broadcloth fur lined overcoats, lined throughout with Australian mink, large genuine Persian lamb collars, sizes 36 to 48. Value $75, will sacrifice for $35 each. Also several ladies' handsome long fur coats, satin lined, worth $90, while they last, $35; and few large size fur robes, plush lined, $15 each. All guaranteed new. Examine before buying. Send express charges, will send on approval. Write or call. E. ROBERTS, Room 8, 160 West 119th St., New York.

I HAVE for sale a first-class touring car, in A1 condition; it cost new $1,750; if it had the name Packard or Peerless on it somebody would readily pay $1,500; my price is $750; it's a big bargain for some one; if you're from Missouri and want to be shown, we're ready. W. J. FORBES, 243 Columbus Ave., Boston, Mass.

WANTED—A first-class man to take the agency for the latest invention on the market, a rubber cover for automobile steering wheels called STEEREASE. Write for full particulars. Address DEPT. K, GOODYEAR RUBBER HOSE & PACKING CO., 221 Chestnut St., Phila., Pa.

PREST-O-LITE tanks wanted for cash. O'NEILL, 186 Putnam Ave., Brooklyn, N. Y.

WILL sell or trade 60 foot mahogany motor yacht for automobile or real estate. 212 Niagara St., Buffalo, N. Y.

FOR SALE—Packard touring car, driven 5,000 miles. FRED J. TERHAAR, 1560 Dewey Ave., Rochester, N. Y.

SEVENTY $2,000 cars handled the past season, but we need more capital. We have the best selling proposition in a western city of 100,000, with territory comprising seventeen counties. Throughout the country agencies for this car are acknowledged more desirable than any other in its class. Address Box 215, care The Motor World.

PEERLESS AUTO TOP DRESSING
Waterproofs mohair and duck automobile tops and curtains. Makes faded and stained tops look like new. Leaves the cloth soft and pliable. Dries over night.
The Columbus Varnish Co., Columbus, O.

AUTOMOBILE Cylinders reground, new pistons and rings fitted. Garage air compressors. CAST IRON BRAZING CO., Manchester, N. H.

WE have a very large wholesale clientele and are open to take up European agency for a new motor accessory. Write before sending sample. K., B. & CO., LTD., 5 Rue Auber, Paris, France.

TWO 1-ton Kelly motor trucks for sale. These trucks are in very best condition, but not adapted to our work. Will sell at reasonable figure. THE EDWARD WREN CO., Springfield, O.

WILL GIVE MY PERSONAL MORTGAGE on improved real estate for a 1911 or 1912 Auto in good shape and worth prices asked; must be a reliable make. C A. SACKETT, 21 Broad St., Milford, Conn.

WANTED—Town car or touring car body for model T Ford, fore door preferred, but any model considered, state price. A. J. SMITH, Plymouth, Mass.

PEERLESS BACK AND CUSHION DRESSING.
A renovator for leather seats and cushions. Brightens the finish, softens the leather and does not crack or peel. Dries in 20 minutes.
The Columbus Varnish Co., Columbus, O.

STEAM Vlucanizing Plant—Complete, worth $200; only $25. 3528 N. 27th St., Omaha, Neb.

PEERLESS EXTRA FINE BLACK BAKING JAPAN.
Bakes to either a high gloss finish, eggshell gloss or dull finish, on lamps, radiators and fenders. Will not crack, chip or peel.
The Columbus Varnish Co., Columbus, O.

An ad. like this will cost you $1.95 for each insertion.

Mr. Dealer:

You will surely find some where among these announcements a buying opportunity—

A straight line to something you want now—

Look them over and see—

* The circulation of The Motor World is a guaranteed one, sworn to by an affidavit, which will be sent in detail to any one upon request.

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For Sale—Wants—Exchange

15 cents per line of six words, cash with order: — In capitals, 25 cents per line —

A market place where Dealers, Jobbers and Manufacturers may buy, sell or trade used cars, parts and appliances and where help or situations may be secured at a nominal cost.

ONE 5 passenger Auto body, with top, $35.00. Rear axle, $20.00. H. KASKEL, Spencerville, O.

BROKEN CRANKSHAFTS, cylinders, crankcases, flywheels, gear teeth, pistons, perfectly welded and machined ready to replace. Guaranteed and references. Machinery up to 5 tons welded. ATLAS WELDING WORKS, 74-76-78 Irving St., Rahway, N. J.

PEERLESS LINING DYE.
Makes a new lining out of a dirty, faded and stained inside. Will not fade or wash off. Leaves the cloth soft and pliable.
The Columbus Varnish Co., Columbus, O.

SALESMEN, one who is now visiting automobile trade or owners. Good money made on a very attractive proposition. STURDY MFG. CO., 2637 Michigan Ave., Chicago, Ill.

FORD SHOCK ABSORBERS
will make your car ride like a Pullman. Easily attached, fit perfectly. Special introductory prices. Agents wanted. THOMAS AUXILIARY SPRING CO., Canisteo, N. Y.

SCHEBLER CARBURETOR.
J. C. NICHOLS.
DIRECT FACTORY DISTRIBUTORS.
1673 B'way at 52d St., New York City.
Tel. 6161 Col.
Our new model L Carburetor with three speed adjustments, at half price by returning your old model Carburetor.

AUTOMOBILES—A. C. C. A. Prices Talk! Every make. Every model. Hundreds runabouts, racy roadsters, five-seven passenger touring cars. $50 up. Guaranteed five years. Shipped Freight Prepaid! Write today for the largest Illustrated Catalog published! THE AUTOMOBILE AND CYCLE COMPANY OF AMERICA, Dept. I-N, 1769-1787 Broadway, New York City.

MOHAIR—DUCK—CANVAS—TOPS
Made to Look Like New.
PEERLESS AUTO TOP DRESSING
makes faded and stained tops a uniform black color, putting back the life that is worn out by the rain, sun and use. Leaking tops are waterproofed with one coat. Leaves the cloth soft and pliable. Anyone can apply it. Prices, 1 gal. $3.75; ½ gal. $1.90; ¼ gal. $1.00. Express collect. Have your dealer order.
THE COLUMBUS VARNISH CO.,
Columbus, Ohio.

FORD OWNERS—GET OUR CATALOG. AUTO PARTS CO., PROVIDENCE, R. I.

KENNEY NUT LOCK. Won't jar off. Holds tight wherever vibration exists. Patent and all rights for sale. Dr. W. F. KENNEY, 122 Hope St., Providence, R. I.

MARQUETTE BUICK, 100 H.P., first American car to finish in Grand Prize. Perfect condition, new tires, $1,000 worth of extra parts, run 1,800 miles. R. L. HOWARD, 81 Manhattan Ave., New York City.

POPE HUMMER, 60 H.P., holder of world's straightaway records from 10 to 300 miles regardless of class; perfect condition, new tires, extra parts. R. L. HOWARD, 81 Manhattan Ave., New York City.

AGENTS WANTED—To handle the $1000 G. J. G. "Junior," racy, classy and specially designed chaseabout with 104-inch wheelbase, with a real 26 H.P. motor, Bosch magneto, Dorian remountable rims with 32 x 3½ tires, at a price of $1000, which is a money maker for the sales agent. Write for literature and discounts to G. J. G. MOTOR CAR COMPANY, White Plains, N. Y.

FOR SALE—Dealer in new and second-hand automobiles; Ford runabout, 4 cyl., 26 H.P., top, windshield, rumble seat. Maxwell runabout. Oldsmobile, 4 cyl., top, 5-passenger, and windshield. Rambler, 2 cyl., top, 5-passenger, and delivery body, all in good condition. F. B. ARDRIE, 21 Carnes St., W. Lynn, Mass. P. S.—Wanted—to buy 50 automobiles.

PEERLESS LEATHER TOP DRESSING
Makes leather, rubber and pantasote tops and curtains look like new. A safe, durable renovator that leaves the cloth soft and pliable.
The Columbus Varnish Co., Columbus, O.

WANTED—First class electric automobile machinist and repairmen in Denver, Colo. P. O. BOX 1023.

AUTOMOBILISTS—Buy guaranteed tools and inner tube puncture-repairing material. Do your own repairing easily and quickly. Agent's price, $5.00; ours, $3.50, cash with order. Bank references. W. H. MIZELLE, Robersonville, N. C.

SCORED CYLINDERS repaired, $12. No enlargement of bore—no need for new pistons and rings. Send piston with cylinder. Absolutely reliable method. References, testimonials, and full details on request. WATERBURY WELDING CO., Waterbury, Conn.

PEERLESS EXTRA FINE BLACK JAPAN.
Enamels lamps, radiators and fenders to a fine gloss finish. Will not crack, chip or peel. Not affected by heat, retains its lustre.
The Columbus Varnish Co., Columbus, O.

FOR RENT—Factory Building, Syracuse, N. Y.; 18,000 square feet floor space, on best street in the city; engine, boiler and shafting complete. Two elevators, city water, gas and electric service, and equipped with sprinklers. Use of railroad siding. Electric cars pass office door. apply GEORGE N. COMLY, 1816 West Genesee St., Syracuse, N. Y.

Then remember that *8,000 other readers are doing the same thing—

5,000 of them dealers—

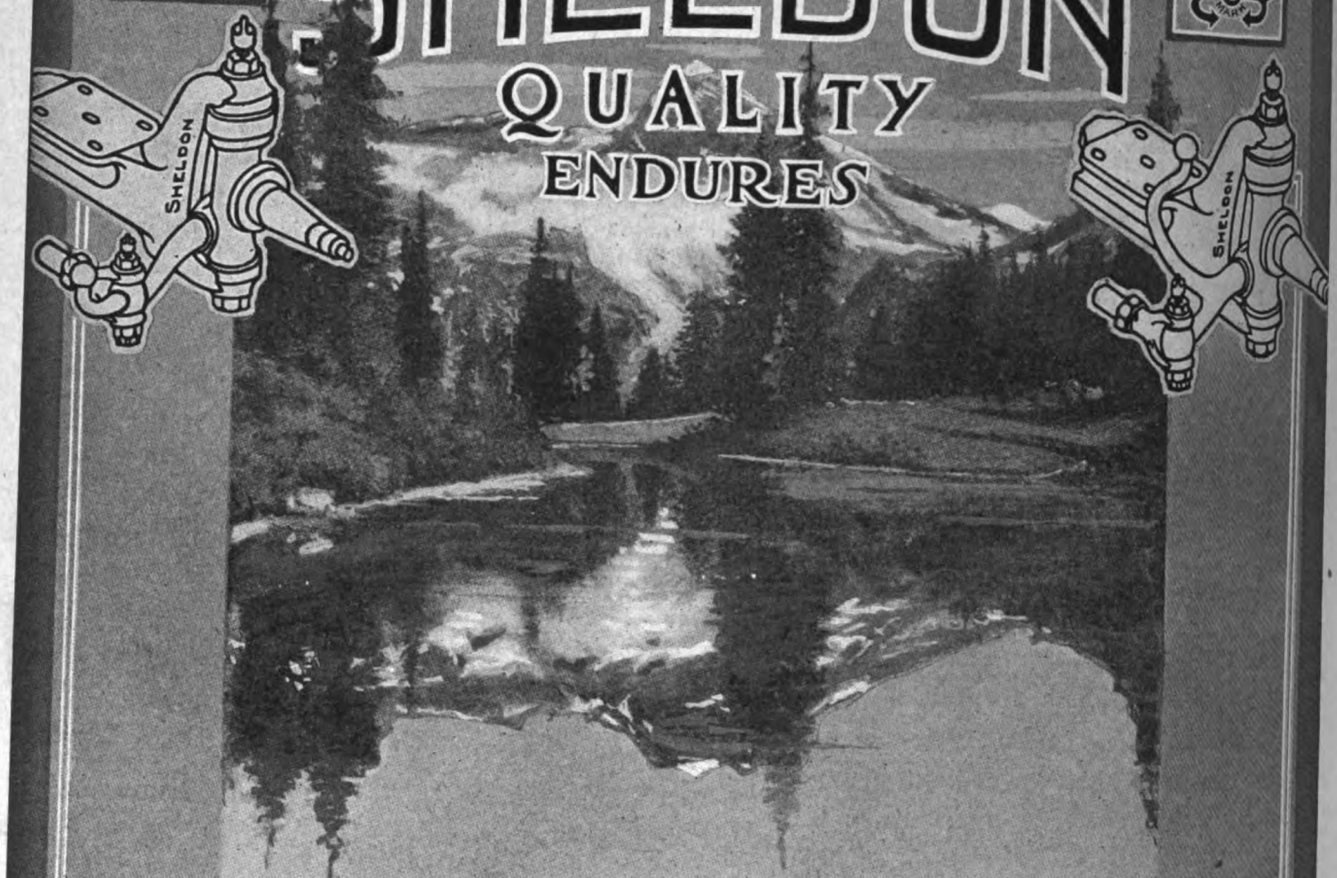
All of them intensely interested in the automobile industry. This means a live selling opportunity that costs mighty little.

An ad. like this will cost you $1.05 for each insertion.

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SHELDON

QUALITY ENDURES



"True merit consists not in doing well what no one else has attempted, but in doing best what thousands can do well."—MACAULAY.

This is precisely the reason why SHELDON quality stands pre-eminent in the axle world—the reason why SHELDON AXLES outwear those of other manufacturers.

We do not claim to be the only manufacturers of good axles, but we do claim that what so many other manufacturers are doing satisfactorily today we are doing best.

There is every logical reason for SHELDON quality.

1. Our gigantic and perfectly equipped plant. If ever an industry required facilities for perfect production, it is the axle industry.

2. Our immense staff of expert and thoroughly satisfied workmen. SHELDON AXLES are produced by men who were born and raised in the axle business.

3. The SHELDON product is the result of thirty years' experience in the manufacture of axles. We have seen imperfect designs come and go, and we have profited by past errors until our finished product is faultless in design and execution. These are some of the reasons for SHELDON quality.

SHELDON AXLE COMPANY

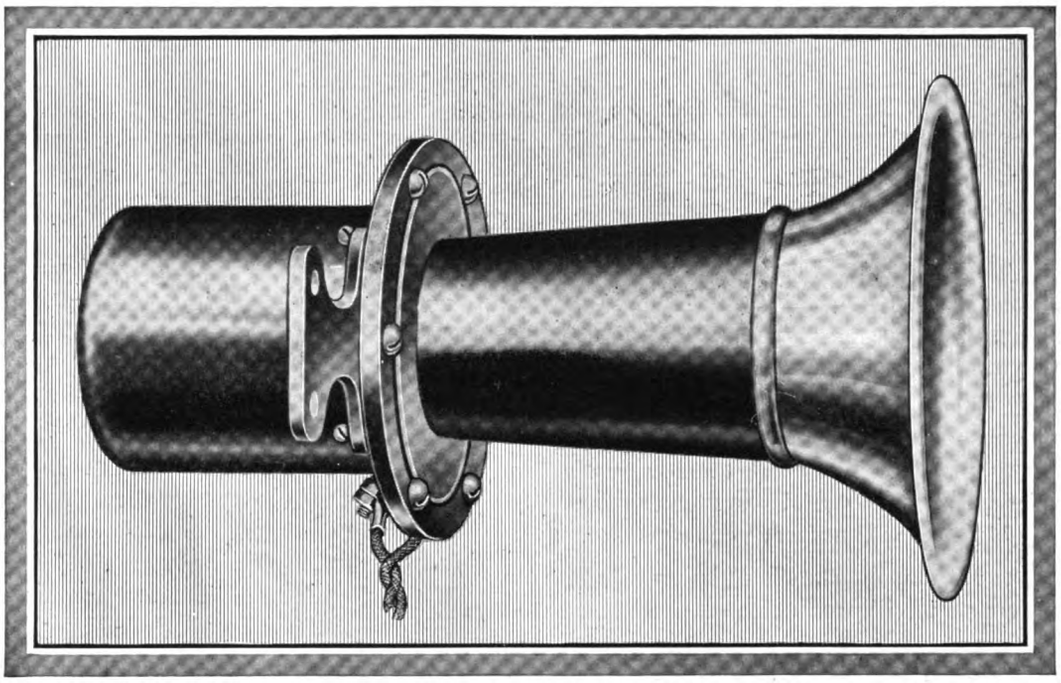
WILKES-BARRE, PA.

CHICAGO BRANCH: 68 E. 12th St.

DETROIT BRANCH: 1215 WOODWARD AVE.

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KLAXON



REPUTATION

JUST what IS *the reputation behind the Klaxet?*

Who are its makers—its sponsors? What have they done to warrant confidence in the quality, the efficiency, the permanent satisfaction—of this, their newest product.

IN France, in Russia, in China, in Brazil, in New Zealand, in Egypt, in Cape Town, in Hawaii—*everywhere* where the automobile is known—mention of the word "Klaxon" immediately brings to mind a sharp, loud, danger-expressing note of warning.

Not only in the United States—where four of every five high-grade cars, *by actual figures*, carry Klaxons—but throughout the world, "KLAXON" is the generally accepted word for automobile warning signal. Just as "KODAK" means "camera," and "GILLETTE" means "razor."

And wherever it is used, Klaxon stands for utmost quality, unquestioned dependability, maximum efficiency.

THIS is the reputation—the record of proven performance—dominating success—that is behind every Klaxet—

Smaller than the Klaxonet: operating on exactly the same principle. Finished in brass; nickel; black and brass; black and nickel; all black; sold under the regular Klaxon guarantee; complete with wire and push-button - - - **$12**



KLAXONET

Lovell-McConnell Mfg. Company Newark, N.J., U.S.A.

KLAXON

"The Public Safety Signal"



KLAXON

KLAXONET

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Studebaker

As a Dealer There Are Some Things You Will Consider Carefully

You want to make money. But you want to make money not only today and tomorrow—you want to see the money ahead of you for years to come.

To be able to do this—to be able to see business coming along in good shape—you are always thinking of your reputation. For this reason you want to represent a manufacturer who will not only assist you to the limit in making money but who will protect your reputation.

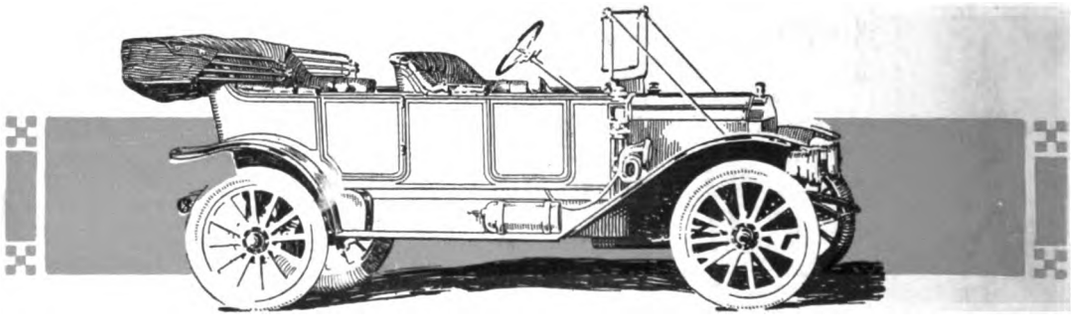
And for exactly the same reason The Studebaker Corporation wants dealers who will protect its reputation.

The Studebaker Corporation offers you a line of automobiles, both for pleasure and delivery uses, that are built to protect the reputation of both the manufacturer and the dealer—because they insure in the fullest and most absolute way the continued satisfaction of the owner.

To you as a dealer the unquestioned standing of The Studebaker Corporation is of immense importance, because it is an assurance solidly backed by sixty years of business success. The habit of integrity and success is strong, and its strength is your strength when you sell Studebaker cars. It brings confidence—the confidence which you as a dealer know is the great big factor in selling.

As a dealer you appreciate co-operation. The Studebaker Corporation is not only giving its dealers the personal co-operation of experts, the systematic co-operation of its organization, and substantial assistance in maintaining satisfaction through the national Studebaker Service with its 36 factory branches, but it is always helping Studebaker dealers sell cars. It is doing this in the most practical way by liberal advertising in magazines, big national weeklies, leading newspapers and in dealers own local papers as a close practical help. It is doing this all the year round—not in spurts for a season—so that Studebaker dealers sell cars all the year round.

Look at the extensive advertising we are doing at the present time and consider what it means to you as a dealer.



The $800 Studebaker (Flanders) "20"

Equipped with Top, Windshield, Prest-O-lite Tank and Speedometer, $885 f.o.b. Detroit

STUDEBAKER CARS

(Nickel or Brass Trimmed)

STUDEBAKER (FLANDERS) "20"	
Touring Car	$800
Roadster	750
Utility Car	800
Delivery Car	800

STUDEBAKER (E-M-F) "30"	
Touring Car	[illegible]
Detachable Demi-Tonneau	[illegible]
Roadster	[illegible]

See our dealer. You can get prompt delivery. Our Art Catalog A-9 is yours for the asking.

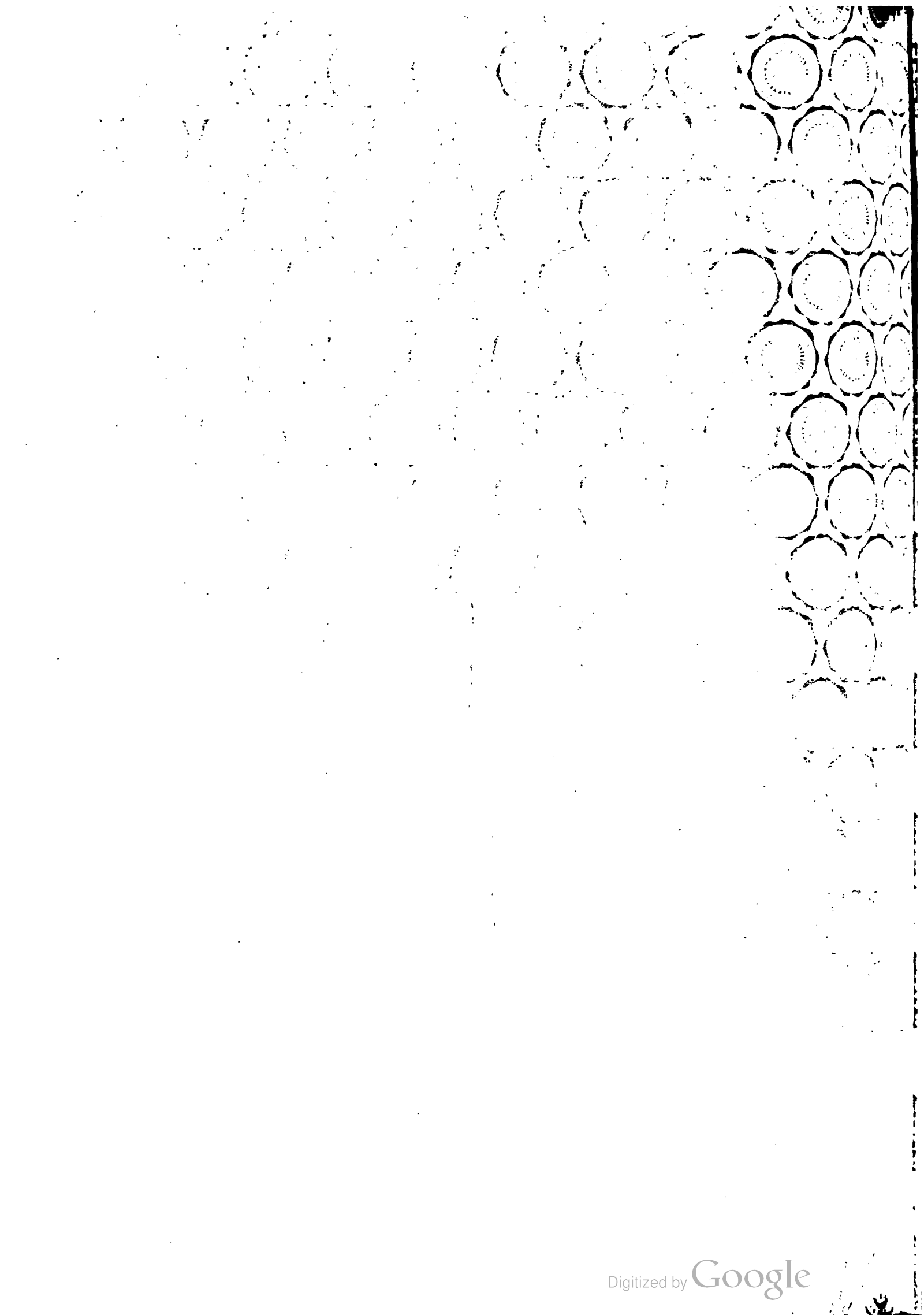
The Studebaker Corporation Detroit, Michigan

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